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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXIX.

MR. A. FAULL.

MR. A. FAULL, the Senior Assistant Controller of the Central Telegraph Office, has spent 38 years in that Department, having entered it as a telegraphist in August, 1892. In May, 1901, he was appointed, after a competitive examination, to the clerical force of the office and remained on that establishment till 1925, when he returned to the



instrument rooms as Superintendent, Higher Grade. A year later he was promoted to his present post.

Mr. Faull's long service and varied experience have given him a thorough knowledge of the telegraph service and a solid grasp of the details of the organisation of the large department, where he holds so responsible a post. He is, first and foremost, a C.T.O. man, and it is not surprising that he finds recreation in bowls, that most popular of games in the C.T.O.

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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVII.

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"AFFORDING" THINGS.

THE contributor of an article which we publish in another column quotes an extraordinary dictum from a periodical to the effect that "anyone owning a telephone is probably in a position to buy a car." This statement is such a patent absurdity that it could only be indulged in by some careless thinker who had made little study of the facts and had derived his information from loosely-worded allusions in the Press to "costly telephones." Telephone service runs, we know, from £5 10s. a year upwards; and, in a London residence, you can rent a telephone and pay for over 700 outward local calls for £10 a year. For about £30 a year a London resident could, in addition, luxuriate in a modest number of calls to New York, Paris, Vienna, Stockholm and Madrid—something, we think, in the nature of a "Rolls-Royce" service, something, that is to say, which is not telephone service reduced to its most meagre terms, and therefore not comparable with the cheapest form of motor car. We would ask car owners how much £30 a year will cover in the shape of capital charges, taxes, insurance and the purchase of petrol.

Our contributor remarks that it would be interesting to know the number of car-owners who are not telephone subscribers. We cannot pretend to solve this enigma, but we are able to say that after cancelling out those who possess a telephone but no motor car by those who possess a motor car but no telephone, there remain about 400,000 car-less people who are telephone subscribers.

After all, there is no absolute criterion of what one can afford. It is a psychological as well as an economic question. One may

encounter, for example, the man of very moderate means who would consider it a wild extravagance to buy two sixpenny reviews a week (even though he enjoyed reading such reviews), but who would, nevertheless, think nothing of spending two shillings on three infinitesimal measures of whisky during half an hour's chat with a friend. Custom and example have persuaded him that he can "afford it." Again, it is an old complaint of authors that men who consider three-guinea rackets a *sine qua non* and despise tennis balls at less than fifteen shillings a dozen, hesitate to buy a new seven-and-sixpenny book. They prefer to obtain their "reading" from Mudies. There are, again, those who, if they found the library subscription was as high as the subscription to their golf club would perhaps ask themselves whether they could "afford" it. All this demonstrates that what a man eagerly wishes to enjoy he will, so far as his means allow, afford. The affording of one amenity will, of course, often exclude the affording of another.

There seems to be, in any case, apart from the huge disparity in cost, little point in arguing whether a telephone subscriber ought to be able to afford a motor car, or *vice versa*. A man who ardently desired and could afford to buy a boat would scarcely be interested to know whether a motor car would cost half (or twice) as much, and still less whether he might be considered as a potential motor owner. The connexion between motor cars and telephones is, as we have remarked on other occasions, purely fortuitous; it happens that the numbers of each in this country range between something like one and a half and two millions. Both, under varying conditions, can be either a necessity or an amenity of life. Without venturing on any discussion whether existing telephone rates are high or low we can see that actual cost cannot be a determining factor in preferring telephone or motor car, assuming you can only afford one of these conveniences.

HIC ET UBIQUE.

UNDER the heading "Secret Revealed," the *Sunday Pictorial* says:—

"I overheard a Communist speaker haranguing a small crowd during the week. He was telling his listeners that the new public telephone boxes, placed at the most convenient spots and in places where they command several routes, are really put up by the authorities to serve as cover for machine guns in case of a revolution! I have heard the General Post Office accused of many things, but who would have credited it with so much guile?"

Our correspondent who sends this adds: "As the Reading district has been very prominent in the matter of erecting kiosks, I trust that the authorities, when the awful day arrives, will afford police protection to the officers responsible for the choice of the strategical points for placing the kiosks."

A concession, says *The Electrical Review*, has recently been granted by the Greek Government to the Siemens & Halske Co., Berlin, for the working of practically the whole of the telephone system throughout Greece. The concession provides for the extension of telephonic communication in the country and the modernisation of existing exchanges. In Athens and the Piræus 7,000 automatic connexions, in Salonika 3,000, and in Patras

1,000 are to be provided within the next few years. The concessionaires have undertaken to transfer the working of the system to a new company to be organised with an initial capital of £500,000, which, while being mainly subscribed by the German company, will be provided partly by Swedish and Greek interests.

According to Reuter's Trade Service, the General Council of Sofia has assigned a sum of 750,000 leva for the organisation of telephone communication between 42 villages in its districts. The communes interested will supply the necessary posts and the technical work will be in charge of the Ministry of Posts, Telegraphs, and Telephones. The 750,000 leva mentioned is for the purchase of apparatus and wire. The total length of the new lines will be 230 kilometres.

A "Woman Journalist" in the *Scotsman* writes as follows:—

"Summer holidays take us afield, and we soon discover that there is hardly a hamlet left, in the remotest corner, that does not boast a wireless set. But the rustic mind vaguely mistrusts it here and there. For one thing, as a country roadmender put it, "Them wireless sets don't always speak the truth. The one in our village doesn't anyway." I don't know in what respect it had offended the shade of George Washington on that particular occasion, but he always had a spleen against it. Nor was he alone in this attitude. One day the farmer's hand was very pleased with himself. He had found out how they got the "news" on the wireless. He had seen the accumulators going into town to be recharged. He had seen through that at once, of course! They sent those little "boxes" in when they were empty and just had them filled up with the news and sent out again. Then they rolled out the news till the boxes were empty, when they sent them in again to be refilled. The whole thing was as plain as a pikestaff. It was bound to leak out sooner or later, but I don't know who is going to break it to the B.B.C."

The *Electrician* relates: Though it may be understood that the majority of calls passing over the transatlantic telephony route relate to business transactions, we have just heard for the first time of the service being used for the successful tendering for a contract. One of the largest colliery companies in the United States invited tenders for coal cutting appliances, and though there was keen American competition and a 30% tariff obstacle, the British firm, Messrs. Mavor & Coulson, explained their proposals over the transatlantic telephone to such good purpose that they secured the order there and then. We may add that this information was received from a source other than the firm concerned, and doubtless other manufacturers have used the overseas telephone services for similar purposes. A similar achievement by an American firm would not have been allowed to pass unnoticed.

The London Engineering Department have received the following letter:—

"Dear Sir,—I am Ever So Sorry to Have to write to Complain again about My Wireless, But I have just Had it all rewired and spread out in a Longer Case, and its been going lovely I paid £2 8s. 0d. and £3 0s. 0d. For an Electric swich on its own and an Eliminator off Mr. . . . its only this last few Days The Neighbours over My Head . . . Has just got one and I beleave Mr. . . . the young Man what made mine if one calls it such *some make* I meet him 2 or 3 times just passing my Door with . . . to go up into her House whoever it is they Seem Bent on Not letting me have what I pay for I have payed 5 years Licenc I only had a cristle Set at furst but Now I've a 3 Velve Set and *now* I can't get it properly Since about Thursday or Friday Someone makes it Scream Awfull & then Crack and grind untill they take the Music Right away From me. And of course I keep trying to get it, but while I am trying to get it it keeps making such a noise it goes *wee woo wee woo* and then screams So dreadful that I cant Stand it, and My Husband don't understand anything about wireless So He Cant do anything to it. He is The Caretaker of this Building. I'm wondering if theres anyone feels spiteful against *us*, I should be ever So grateful to you, if you could do Something to let me Have what I pay 10s. a year for, Mr. . . . is on His Holliday but it was quite alright when He left it. Please Kindly Oblige Mrs. . . .

"P.S. it is Sunday Evening and because its raining I've not gone to Church. I thought I would get a nice Survie on My Wireless, and My Husband is stopping in for *once*. I keep Fearing every minute he will slide off out for a drink because of No Music to Interest him, I can't understand it, I have a fresh Acumlater every week, and I've put some coppers in the meeter I can hear the wireless all up and down the Block and I cant get it only for a few minutes, then the wee wee woo wooing untill its gone. I trust you wont

think me taking a liberty, but I'm feeling depressed over it, and *mine* has just gone out untill 10 o'clock I suppose.—I remain, Yours Respectfully,
Mrs. . . ."

The London Engineering staff are giving the unfortunate lady's problem their earnest attention.

We learn from the American papers that the New York Telephone Company have taken steps to stabilise, as it were, the last entry in their telephone directory. Our readers will remember the Zzyz and Zzyxes who strove for the coveted last place. No longer will it be possible to prefix an extra z or two to your name in order to obtain this distinction. You are now required to produce a birth certificate or something of the sort showing that your name is Zzyz; otherwise you are relegated to your proper alphabetical place in the directory as Elmer Jones or Earl Smith.

The following American jokes are culled from our contemporary, the *Telegraph and Telephone Age*:—

Telephonic.

"Give me Main 4321—Hello; this the wife?"

"Yes."

"Listen, Dear. Will it be all right if I bring a couple of fellows home for dinner to-night?"

"Why, certainly."

"What?"

"Certainly it will. I'd be glad to have them."

"Oh, pardon me, lady. Wrong number."

Telegraphic.

"Did you deliver that telegram?" said a clerk to his messenger boy.

"Yes," was the reply, "only the man doesn't live in Grover Square, but in Queen Street, and not on the ground floor but up three flights of stairs, and not in the front room but in the back one; besides, his name isn't Johnson, but Thompson, and he isn't a man, but a woman!"

Wireless.

HOUSEHOLDER (hearing noise downstairs): "Who's down there?"

BURGLAR (with great presence of mind): "This is station WEEI now signing off until tomorrow morning at seven o'clock. Goodnight, everybody."

CIVIL SERVICE ARTS BALL.

THE Civil Service Arts Council announce the completion of the preliminary arrangements for the Civil Service Arts Ball in the forthcoming winter season. By arrangement with Mr. Bertram Mills they have booked the Royal Opera House, Covent Garden, for this event, on Nov. 28, from 8 till 2. Two bands have been engaged and a high-class cabaret entertainment will be given during the evening. Those coming are expected to wear fancy dress, but those who prefer something more prosaic may wear evening dress. As an encouragement, prizes will be awarded for costumes, and the Council are particularly anxious to encourage societies to send homogeneous groups.

The price of the tickets will be 3s. 6d., and the boxes in the upper tiers will be reservable at half a guinea per box. Refreshments will be obtainable at usual prices, and application will be made for an extension of licence. To meet the convenience of those who may have difficulty in reaching home after the usual transport has ceased to run, arrangements will be made for motor coaches to run after the ball to the outlying suburbs at a fare of 1s. 3d.

In order to widen the interest in the function the Council have enlisted the active support of Civil Service organisations and have set up a large and representative general committee, who have appointed an organising committee consisting of Miss G. Fowler, Messrs. J. A. Allan, H. W. Fenn, E. Jacob and L. G. K. Starke, under the chairmanship of Dr. G. F. Herbert Smith, Natural History Museum, S.W.7, to whom all correspondence with reference to the ball should be addressed.

This will be by far the largest and most comprehensive social function that has ever been arranged for Civil Servants, but little doubt can be felt for its success, and the wise will apply early for tickets as the Council have decided to restrict their number rigidly.

PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

By J. J. T.

(Continued from page 238.)

THERE has resulted, as a sort of by-product of broadcasting, yet another type of "interference" with the comfort of our fellow-men. One is unable to discover whether Ilford (Essex) contains an abnormal number of careless wireless licenceholders or not, but the municipal authorities have felt themselves compelled to issue a regulation prohibiting passengers from taking wireless accumulators into the municipal trams. The reason for this restriction is simply the abnormal number of public complaints of the spoilt clothing of tram passengers due to spilt acid carried by fellow passengers. What wheels there are within wheels of our ever-growing complicated civilisation!

It is questionable whether the following two items of broadcasting news should be classed among the desirable developments or not: Berlin reports the manufacture of a mammoth loudspeaker audible in a circle of 25 miles diameter and equal in volume to an orchestra of 2,000 instruments. Fortunately it is not of the "portable" type, as it weighs just over one hundredweight.

Here in our own land we are promised "A voice from the sky" from "one of the new voice-producing aeroplanes," which, so the London *Daily News* has informed us, "are being developed to broadcast regular messages and announcements at a high altitude over any popular resort or city." The aeroplane itself will be driven by a couple of the powerful Rolls-Royce aero engines developed from the Schneider Trophy racers. Fortunately a special device will exclude engine and other extraneous noises, so that we shall have the full unadulterated benefit of hearing the voice of the operator speaking into his sound-screened microphone four or five thousand feet above us, his speech magnified a million times or so and then directed downward to the earth-men!

A new law in Uruguay is not at all likely to reconcile the theatre and concert hall proprietors to the latest developments regarding broadcasting in that country, for the *Wireless World* informs us that it is now compulsory upon the part of such proprietors to *permit* their performances to be broadcast. The penalty for refusal is 100 pesos (£20) for each offence.

Broadcasting Reception in Large Buildings.—Reuter's agency in New York assures us that a new hotel, now in course of erection in that city, is to have what (*of course!*) is claimed to be one of the world's largest wireless reception installations. Nearly 200 miles of wire will supply a choice of six wireless programmes to each of the 2,000 rooms.

We need not fear, however, for "L'il ole London town" is not exactly behind in these matters, witness the luxury flats over Baker Street station, which for some little time now have been successfully equipped with suitable apparatus. By means of fifteen amplifiers the impulses received by one short aerial on the roof are able to bring entertainment to the occupants of 180 suites. The receiver is left unattended, and is generally tuned to the National transmitter; when the London or Midland stations are to broadcast items of special interest, a messenger is despatched to the wireless tuning room to adjust accordingly. If a tenant specially desires to hear a certain programme, he simply mentions the fact to the telephone operator of the local private branch exchange, and, provided such desire does not clash with the expressed wishes of other tenants, he is switched over. The arrangement takes the place of 180 ordinary receivers, and in addition supplies music to the common hall for dances. Those of our readers who may be interested in the technical details of the London scheme will find photographs and a full description in the *Electrician* of Aug. 22.

Broadcasting in the U.S.A.—There is no doubt a certain amount of criticism regarding broadcasting in Great Britain, and very little justification for much of it, if one may express a purely personal opinion, but if attention be directed for a short time to affairs across the Atlantic, it will be possible for readers themselves to judge how matters stand without a single expression of opinion from the writer. Thus, on Aug. 7, the following appeared in the *Observer* from their New York financial correspondent:—

"The financial report of Radio Corporation of America issued during the first week of August reveals the effects of the recent chaotic condition of the radio industry in this country. Net earnings for the first six months declined to \$505,000, an amount insufficient to provide the dividend coverage on either class of preferred stock." Comparison is then made with the first six months of 1919 when the earnings amounted to \$4,996,437. The more hopeful statement is made, however, that part of the poor showing of the last six months was due to the fact that "the new radio models did not reach the market until after the mid-year."

From an American semi-technical bi-monthly in the same month, a further sidelight on transatlantic conditions is shown, by the following leaderette, on the heavily worked and somewhat abused Federal Radio Commission:—

"The Federal Radio Commission, swamped by applications and tangled in a maze of litigations, is taking a summer breathing spell before renewing its struggles to keep pace with the conflicting demands for the use of the air (? ether). Hearings have in fact been discontinued in Washington until September. Routine business is being carried on as usual, however. When the Commission resumes hearings in the last-mentioned month, there will be more than 300 cases on its docket and about twenty pending in the Courts of Appeal of the District of Columbia. All broadcasting station licences have been extended to Oct. 31 meanwhile, except in so far as special provision is otherwise made.

To relieve matters the Federal Radio Commission has handed over part of their jobs to the Department of Commerce and has requested the 'supervisors' of that department to make a survey of radio programmes throughout the country and the preference of listeners. The supervisors are to gather the information from listeners or from any other source they may consider desirable."

Editorial comment in the *T. and T. Age* of Aug. 16 on "Universal Wireless Bankruptcy to bring Re-allocation of Forty Wavelengths," should provide considerable food for reflection in this country when wireless conditions in all its ramifications of directional, point-to-point, and broadcasting are taken into consideration, for the Federal Radio Commission of America has command of the allocation of wavelengths in which telegraph, cable, and broadcasting interests in the U.S.A. are all involved.

It would require more space than is possible in the present issue of this journal to reproduce the "editorial" above mentioned *in extenso*, but it is hoped to do so in the November number. It will be found deeply interesting.

(To be continued.)

THE DRUMM STORAGE CELL.

By B. S. T. WALLACE, C.T.O.

As no fundamental advance in the method of storing electric energy had been made during the previous 50 years a certain amount of interest and wonder was aroused by the announcement in the press a year or so back of the invention of a new "wonder battery," by Dr. James Drumm, of County Down, Ireland, which was "destined to revolutionise electrical engineering practice."

Many of the early reports concerning this discovery—like most scientific and technical matter dealt with in the lay press—were

obviously inaccurate and misleading, though, reading between the lines, one could discern that there was possibly "something in it."

As the matter is of supreme interest to a large number of wireless users, the writer has endeavoured to obtain some accurate first-hand information concerning this invention. The effort is summed up in the following paragraphs, and readers can form their own opinion as to whether there is any hope of discarding the present antiquated and "messy old accumulator."

The development of the Drumm storage cell is under the control of the Irish Free State Government, through their Minister of Transport and Commerce.

It is apparent from the reports issued concerning it that it is being developed primarily for possible railway traction purposes under conditions especially applicable to Ireland, utilising power from the Shannon electric supply that would otherwise be running to waste.

Though no direct technical information concerning the cell itself is vouchsafed, detailed reports on the behaviour of a battery of these cells when used for traction purposes have been received from the Minister of Transport, and from these, by deduction and inference, one is able to form some idea of the cell and compare it with the present lead accumulator.

It can first be stated that the results of the practical tests of the battery as a traction unit are very satisfactory. Whether it would be an economical proposition depends on the life of the battery, its capital expense and maintenance costs, balanced against the expense of the alternative of a third rail.

The Drumm cell is described as a low-resistance alkaline battery, with a voltage 50% higher than existing alkaline batteries, and the principal advantages claimed for it are:—

- (1) Rapid input and output of energy.
- (2) Robust construction.
- (3) Freedom from fumes and gassing.

The energy efficiency under practical conditions of working is given as 75%, and the current efficiency 95%.

Examining the voltage first, we can take for comparison an Edison nickel-iron cell. This has a voltage that is continually falling throughout its discharge and the fall is uneven, being steep during the first quarter of the discharge period. For an even discharge of current the voltage commences at 1.5 volts, reads 1.2 when half discharged, and drops to 1.1 before becoming discharged. The comparison made with this type of cell and the energy efficiency figure of 75%, imply that the Drumm cell has a similar falling voltage characteristic and that its average voltage is approximately 2 volts.

This may not be a very serious matter for traction purposes, but where constant voltage is essential, as in wireless work, it is a great drawback. Voltage regulators can be employed, but they would largely negative any advantage gained in other directions.

This fact alone rather spoils the vision that the day is at hand when one can dump an accumulator on the counter, ask for 10 ampere-hours, and watch it being poured in like a gallon of oil into a can—a feat that can almost be accomplished with this new cell.

Rapid charging and the capacity for giving sudden heavy discharges for quick acceleration are of first importance in traction work. During one of the test runs of the Drumm battery-operated train two charges were given; one at the rate of 400 amperes for 20 minutes, the other at the rate of 200 amperes for 10 minutes. The maximum current output used for acceleration was 1,000 amps., and the drop in voltage when taking 800 amps. was 20 volts. The total open-circuit voltage was about 130 volts. With a battery weight of 6,000 lb. these are striking figures. Any existing type of accumulator would soon be ruined by such loads.

The claim that the new cell is of more robust construction and easier to manufacture than other types is possibly true enough.

Neither the lead nor nickel-iron cells are particularly robust, the latter being especially difficult and expensive to manufacture.

An unexpected factor is revealed in the following detail: "An output of 6 watt-hours per lb. weight of material is available during discharge." Approximately 8 watt-hours per lb. is obtained from a lead accumulator, so the Drumm cell offers no relief from the appalling weight of all these storage cells. As pointed out in the report, this can be off-set by the very high charging rate permissible, and providing the charging points are suitably located, a much smaller battery than would otherwise be necessary may be carried.

A claim which would appear to be of little or no importance with batteries continually and heavily worked is "that in respect of retention of charge it is superior to existing batteries of similar type," i.e., alkaline cells.

This is curious. These batteries have a reputation for retaining their charge for very long periods. The writer is personally acquainted with one that has not been charged for several years and is still working, though only ringing an electric bell.

There are other questions of importance which are not dealt with in the reports, principally that of electrolyte maintenance. With existing forms of alkaline cells it is imperative that the plates should always be covered by the electrolyte. Should any portion of them become exposed to the atmosphere through evaporation or leakage, that section is rendered useless beyond repair.

The absence of fumes and gassing claimed for the Drumm cell does suggest a more simple chemical reaction than occurs in other batteries.

It is understood that the positive plate is composed of practically pure silver and that the electrolyte is a salt of silver. Starting with this very expensive handicap, it would seem that the Drumm battery is only likely to become a commercial proposition if it definitely has an unlimited life and no maintenance difficulties or expenses.

Life tests are proceeding, and quoting again from one of the reports, "the evidence already accumulated indicates that it will have a very long life."

For the sake of the economic future and prosperity of civilisation one can only hope that the encouraging event of a Government fostering the invention of one of its subjects will prove a success.

C.T.O. NOTES.

Promotions.—Mr. H. W. Dunne, Superintendent (H.G.) to Assistant Controller.

Messrs. T. W. Jones, Superintendent (L.G.) to Superintendent (H.G.); W. M. Knight, E. R. Jones, A. E. W. Wheeler, Assistant Superintendents to Superintendents (L.G.); E. H. Hough, A. Mee, R. T. Sutton, W. C. Smith, and W. Lambert, Overseers to Assistant Superintendents; H. J. Emberson, W. S. Riddle, F. Penn, H. J. Sumner, F. W. Lobb, F. W. Capron, H. F. Atkins, Telegraphists to Overseers.

Mr. W. R. Coppendale, Tube Attendant and Night Collector, to Assistant Inspector of Messengers.

Retirements.—Messrs. G. A. Costello, Superintendent, J. W. Baker, E. S. Pratt, Assistant Superintendents, W. J. Wells, A. Blackman, E. J. Clapp, Overseers, and E. F. Doyle, Telegraphist.

Obituary.—We regret to record the sudden death of Mr. J. H. Couldrey, late—and the last—Superintendent of the old Intelligence Department of the C.T.O. He entered the service at Oxford in 1873, and transferred, on promotion as News Distributor in the Intelligence Branch of the Secretary's Office, in 1878. This branch was eventually placed under the Controller, C.T.O., and the late Mr. Couldrey succeeded to the head of the section in 1906. He retired in 1916. We extend to Mrs. Couldrey and family our deep sympathy.

Operatic.—The C.O.D.O.C. are giving a performance of "A Country Girl" on the 14th, 15th and 16th instant, at the Guildhall School of Music, commencing each evening at 8 p.m. The price of admission ranges between 1s. 10d. and 3s. 6d. and tickets may be obtained from Mr. J. Henry, Room 17, C.T.O., E.C.1.

SOME MODERN ASPECTS OF ELECTRICAL COMMUNICATION.*

ADVANCES IN TELEPHONY AND TELEGRAPHY.

By GEORGE HOWARD NASH, C.B.E., M.I.E.E.

MR. NASH observed that the Society had encouraged electrical communication from its earliest stages. The word "telephony" had appeared in the Journal of the Society as long ago as 1856, when it was applied to a method of transmitting musical sounds. Submarine telegraphy, the Hughes type-printing telegraph, and the D'Arlicourt method of transmitting writing, had all found a place in the Journal. The most important contribution to the subject that the Society had furnished, however, was the account, on Nov. 30, 1877, by Professor A. Graham Bell himself, of the articulating telephone, on which occasion the harmonic character of alternating electric currents was for the first time revealed and enthusiastically recognised. Since that time, in successive Cantor Lectures, the story of the development of Hertzian wave telegraphy had been told in that room, and the advances in telephony had there been recorded. The present purpose was to make known to those who were not yet conversant with modern developments some of the problems that arise on very long telephone connexions, the means adopted for reducing or for overcoming difficulties, and to explain how, by modern methods of telephony and telegraphy, a number of communications can be made simultaneously, over a single pair of wires, without mutual interference.

The lecture was illustrated by a large diagram that indicated the main links—in a long telephone connexion between two subscribers—over two continents, with an intermediate transoceanic link. An improved form of subscribers' set was shown, more convenient and more comfortable to use than the familiar pedestal type. The difficulty here to be surmounted was the variable distance between mouth and mouthpiece, owing to diversity of size of human heads. Entire freedom of movement of a speaker or listener during conversation by telephone was also a point to be gained by correct design of the set. Mr. Nash then proceeded to describe and to demonstrate a modern automatic system of telephony, and to distinguish this from a trunk exchange, i.e., from an exchange designed for operating long-distance traffic. He explained that long lines are costly, and that consequently they cannot be increased indefinitely in number without raising the price of a call beyond what a subscriber is prepared to pay. The result is that the number must be reduced, with consequent occasional "delay," while subscribers await their turn. Service is thus provided on what is termed a "delay basis," the delay depending upon the number of calls waiting for a free line. This required that calls shall be recorded at the trunk exchanges, and that the proper rotation shall be maintained by a system of tickets to operators. A recording switchboard with a belt conveyor for those tickets was shown. Where long-distance telephony is more highly developed, a sufficient number of lines can be provided to supply a "no delay" service. The recording switchboard is then abandoned and a method of operation known as "the combined line and recording method" is introduced. In this method the trunk-line operator receives the call from the subscriber and makes out the ticket, but the subscriber does not hang up and wait to be called. Instead, the line operator completes the call to the required subscriber and connects the two with little or no delay. The ticket is then stamped. This saves recording positions and a good deal of ticket distributing equipment, and gives much faster service. From the various trunk exchanges the circuit might, for example, now pass by means of "loaded" lines and "repeaters" to a main trunk exchange, similar to an ordinary exchange, except that calls originating for a transoceanic radio link are received at a special position where they are dealt with by a technical control operator.

The arrangements at the Rugby Radio Station were then briefly explained by the lecturer, who referred to the fact that, as a supplement to the long-wave transatlantic link, short-wave circuits are now in operation. For purposes of demonstration it was assumed that, at the receiving station, links of communication with subscribers were installed similar to those on the transmitting side of the ocean.

Attention was then directed to certain effects that manifest themselves on long-distance telephone connexions, which may involve aerial and cable circuits. On shorter connexions these effects are present, but in less degree. They are: (a) attenuation distortion; (b) phase distortion; (c) echoes; (d) interference.

(a) *Attenuation distortion*, sometimes called "frequency distortion," refers to the variation of the attenuation, or to the change of power efficiency, with frequency. An unloaded cable is a prolific source of such distortion, the attenuation increasing rapidly with frequency. The method of loading cables, commonly practised, by the insertion of lumped inductances, at intervals of about 6,000 ft., causes the attenuation to remain relatively low over the most important part of the speech range, after which it rises to a value higher than in the absence of the loading. This results in a reduction of distortion over the essential part of the speech range, but in certain cases the residual distortion may still be intolerable. Attenuation distortion may be removed by the association of suitable resistance-reactance networks

with the circuit; these are usually referred to as "attenuation equalisers," and introduce loss at the frequencies where the line loss is low, so that the sum of the line and equaliser loss approximates to a constant value for all frequencies transmitted. In certain cases, the reactance and capacities associated with the transformers of the amplifier constituting part of a telephone repeater may be adapted to supply the necessary equalisation; this method has found favour in toll cable practice on account of its obvious economy. Long-distance circuits are, of course, not exclusively confined to the transmission of speech and may be used for broadcasting or other purposes, such as picture transmission.

(b) *Phase distortion* is introduced by the difference in time of travel for different frequencies; it derives its name from the fact that the time of travel depends upon the way in which the phase shift of the complete system varies with frequency. The statement by Helmholtz that relative phase shift of different frequencies is not important, applies only to steady tones; it breaks down when the conditions are so extreme that parts of a finite wave-envelope starting at the same time arrive at the receiving end at different times, and when the difference in the time of arrival is greater than 30 milliseconds. In practice, for long distances, phase distortion is automatically eliminated by the fact that the repeaters normally used do not pass the frequency range above 2,400 cycles. For two-wire circuits, high cut-off cables have the additional advantage that their speed of propagation is greater, which makes echoes less harmful. The fact that their impedance is more uniform within the pass-range facilitates the construction of balancing networks; and as their attenuation distortion is small, very little correction is necessary. As an alternative to high cut-off circuits, the use of time delay correcting networks in an analogous manner to that of attenuation equalisers has been proposed. These networks are either of the lattice or bridged T type, arranged so that they build up the time of travel of the fastest frequencies (i.e., the low frequencies in this case) to be as nearly as possible equal to the time of travel of the slowest frequency in the pass-range of the system.

(c) *Echoes* are caused either by the return of part of the speech energy to the talker after an odd number of reflections, or by subsequent repetitions of the speech arriving at the receiving end after an even number of reflections. The term "reflection" is here intended to include any event during the process of which the original speech currents give rise to currents having the direction of propagation reversed. The type of long-distance circuit known as a "four-wire" circuit—in which a separate pair of wires is provided, respectively, for talking in each direction—was described. It was explained that, in practice, exact balance is never obtained. Consequently an indefinite number of separate echoes may arise, but these may be reduced so as to be of little importance. In the case of a "two-wire" circuit, each individual repeater has two balancing circuits associated with it, each of which affords the possibility of reflection taking place; but the reflection occurring at the terminals of the system is the most serious, because the balance there is always worse than at any other point in the circuit. This is on account of the fact that the end of the system has to be connected to a variety of circuits varying comparatively widely in impedance. To eliminate terminal echoes, it is usual to provide some means by which speech currents travelling through the circuit in one direction block the circuit operating in the other direction. This can only be done at a point in the circuit where four-wire operation occurs. In the case of a two-wire system the circuit is, in effect, converted to a four-wire circuit at every repeater in order to permit the insertion of one-way amplifiers. For this reason, and because the highest levels are obtained in the output of repeaters, echo suppressors, whether of the relay type or grid jamming type, are always associated with repeaters.

A typical arrangement for echo suppression used by the International Standard Electric Corporation on four-wire systems was then exhibited. It is in two halves identical in function and differing only in the arrangement of their filament circuits to afford the most economical disposition. Within the working range, the behaviour of the apparatus is substantially independent of speech level in the line. In connexion with the transatlantic circuit, a special type of voice-operated switching device is employed which differs from a normal echo suppressor in that it is capable of suppressing an echo having zero delay. This is made necessary because of the desirability of operating transmitting and receiving stations on the same wavelengths, so that the receiving system is capable of amplifying the relatively weak signals received from the distant station and yet rejects the much stronger signals received from the local transmitting station. For this purpose, to avoid clipping of the speech, it is necessary to introduce delay networks to retard the speech while switching operations are in progress.

The receiving circuit is normally through, and the transmitting circuit is normally blocked. Outgoing speech from the toll board arrives first of all at the amplifier detector bridged across the upper circuit; it operates one relay which blocks the incoming circuit, and another relay which removes the short circuit from the outgoing path. In this condition, incoming speech or noise has no effect on the circuit. With the cessation of outgoing speech, the circuit returns to normal. Incoming speech blocks the outgoing circuit and thus prevents any unbalance currents that pass the terminating set from operating the amplifier detector associated with the outgoing circuit. In every case the delay network is of such a length that the switching processes are complete before the speech arrives at the output of the delay network.

(d) *Interference* in telephone circuits may be inductive or may be introduced by the charging and floating machines associated with the power plants of the amplifier stations. In the case of radio links, the question of atmospherics has also to be considered. Inductive interference is introduced either by neighbouring power circuits, by telegraph circuits on the same

* Lecture given at the Royal Society of Arts on April 10.

route, or by speech circuits on the same route, in which case it is referred to as "crosstalk." Power induction is guarded against by careful survey of the route before laying the cable, by suitable transpositions in the power lines themselves, by bonding on electrified railways, and by selective interconnection of the conductors of the cable at joints to balance the conductor capacities to earth. Interference from power plants is reduced to a minimum by separating power supply circuits from speech circuits and by the insertion of filters in the power supply leads. Reduction of telegraph interference is effected by the use of "noise killers," which are sometimes referred to as "shaping circuits." They consist of low-pass filters to suppress the high-frequency components of the telegraph wave which are most serious in causing interference. Cross-talk is reduced to a minimum by careful adjustment of the speech levels, by balancing the internal capacities in each quad, and by special attention to the inductance and resistance balances of loading coils as well as by taking care to keep the conductor resistance of the cable itself balanced. Special care has to be taken in the layout of repeater stations and in the design of repeating coils, as well as in the arrangement of supply circuits, both low tension and high tension, since these are always common to a large number of repeaters.

The question of atmospheric interference has been left to the last, since it is a very special problem in itself. During certain periods of the day and year the interference by atmospherics, coupled with fading in the signal strength, is sufficient to render the circuit entirely inoperative. To reduce this inoperative period to a minimum, special precautions are taken in the choice of wavelengths, in the location of the transmitting and receiving stations, in the type of antennae, in the type of modulation process and in the operation of the circuit, to ensure that the maximum ratio of signal to noise is always obtained. Generally speaking, it is always possible at any one time to choose such a wavelength that satisfactory communication can be established, and this with a total use of only two or three wavelengths. The removal of the receiving station in England from Wroughton, Somersetshire, to Cupar, Scotland, was brought about purely on account of the better reception; and for the same reason the receiving station in America was located at Houlton, Maine.

Directional antennae are used both for transmission and reception and are an important factor in increasing signal strength and in reducing noise. The single side-band system of transmission in use at Rugby, in conjunction with complete carrier elimination, enables the highest degree of selectivity to be used in the receiving system, combined with maximum radiation of energy at the frequencies carrying the speech characteristics. In the operation of the circuit, precautions are taken to ensure that the radio transmitter is always fully loaded, irrespective of the strength of the speaker's voice, so that the maximum received field strength is always obtained.

Mr. Nash said that the evolution of radio links had now reached such a stage that the terminals of such a connexion could be regarded in exactly the same way as the terminals of a land line connexion—both from a technical and from an operating point of view. It was, of course, evident that, since radio links are usually costly, they should be operated on a similar basis to a high price long-distance circuit, with maximum economy in line time. From a technical aspect, no two points on the earth are so remote from one another that it is impossible to connect them by long-distance telephone. Obvious economic limitations of supply and demand up to now have prevented the installation of many very long circuits. The circuit which was recently set up between Stockholm and New York is an example of the possibilities of long-distance communication. This circuit was 22,400 kms. long and was made up as follows:—

10,400 kms.	of extra light loaded cable.
4,700 "	radio link.
6,850 "	of open wire line.
314 "	of submarine cable.

It was equipped with 138 four-wire repeaters, 24 carrier repeaters, 6 cord-circuit repeaters and 8 echo suppressors, including the special voice-operated switching device at London and New York.

He proceeded to consider how many simultaneous communications could be made over a single pair of wires. In any available telephone circuit of a type consisting either of aerial lines or short cable lines there is available for transmission purposes a frequency range extending from zero, or a few cycles per second, up to 30,000 cycles per second. Various communication systems have been designed to enable the maximum use to be made of this frequency range. These systems comprise: (1) the composite telegraph system, which is superimposed on the telephone system and occupies the frequency range from 0-80 cycles; (2) the carrier telegraph system, which occupies the frequency range from 3,000 to 10,000 cycles; (3) the carrier telephone system, which occupies the frequency range from 5,000 to 30,000 cycles.

(1) *The Composite System*, on an open wire telephone circuit, provides two independent earth return telegraph channels. The speed of transmission over each channel may be up to 25 cycles per second, or approximately 60 words per minute, Morse, and, by the use of the ordinary telegraph duplex balance, the transmission may be in two directions simultaneously.

As the use of telephone ringing current falls within the range 0 to 80 cycles, it is not permissible over a composited circuit, since it would interfere with the telegraph; therefore it is necessary to insert special composite ringer apparatus on the exchange side of the line repeating coils in all cases where the telephone signalling is by 16 cycle currents. The composite ringer translates the outgoing 16 cycle ringing current from the exchange to a higher frequency,

frequently 135 or 500 cycles, and transmits this over the line. Similarly, it translates incoming calling signals from the line and transmits 16 cycle current to the exchange.

(2) *The Carrier Telegraph System* provides 10 independent telegraph channels in both directions, each channel being capable of transmission at a telegraph speed of 40 cycles per second. In carrier telegraphy, the currents are more severely attenuated than in the case of direct current telegraphy, and carrier telegraph repeaters must be provided to compensate for the increased attenuation. These repeaters have been designed so that their spacing will correspond with the telephone repeater spacing on the line, and it is thus possible to accommodate the telegraph repeaters in buildings already housing telephone repeaters.

(3) *Carrier Telephone Systems* provide one, three or more channels over an open wire line or short underground or submarine cable which may be already in use for the usual purposes, e.g., voice frequency telephony and composite telegraphy. From a trunk exchange operator's point of view there is no difference between a carrier circuit and any ordinary trunk circuit. The subscriber will notice only that the carrier circuit is free from the noise usually found on open wire trunk lines. The carrier equipment required can be classified roughly as carrier terminal equipment or carrier repeater equipment. At carrier terminals, the speech frequencies received from a subscriber's set are used to modulate the carrier frequency. Modulation has the effect of converting the speech frequencies to higher frequencies, and it is the latter which are transmitted along the line. At the receiving terminal, the high frequencies are "demodulated," or detected, and thus brought back to their true place in the frequency scale. By moving the frequencies resulting from several subscribers' lines to different parts of the frequency scale, it is possible to provide several conversation channels on the same pair of wires. Separation between the frequencies resulting from the different conversations is effected by means of electric wave filters, each designed to pass a band of frequencies and to eliminate all others.

Carrier repeaters are used on lines where the attenuation is too great to permit of the use of terminals only. They have been designed so that their spacing corresponds with the usual spacing of voice frequency repeaters.

Although it might be thought that carrier apparatus must be comparatively expensive, it is found in practice to be otherwise. In many cases, particularly for distances greater than 200 miles, it is cheaper to install and maintain carrier systems than to provide and maintain additional pairs of wires to give the same facilities. Indeed, a single channel system has proved to be more economical for distances as short as 40 or 50 miles.

The following cases were then described:—

Case 1.

- One normal telephone circuit.
- Two composite telegraph circuits.
- Three carrier telephone circuits.

A total of four telephone and two telegraph circuits.

Case 2.

- One normal telephone circuit.
- Two composite telegraph circuits.
- Ten carrier telegraph circuits.

A total of one telephone and twelve telegraph circuits.

Case 3.

- One normal telephone circuit.
- Two composite telegraph circuits.
- Three carrier telegraph circuits.
- Two carrier telegraph circuits.

A total of four telephone circuits and four telegraph circuits.

All the above telegraph circuits can be worked duplex.

In the first two cases these services can be operated at the same time without much difficulty, but in the third case careful consideration is necessary to ensure the location of the carrier telegraph channels in a range where they will not interfere with or be interfered with by the carrier telephone channels, and it is probable that they will be restricted to the range 3,000 to 5,000 cycles per second.

In the lecture room were set up two terminal equipments connected by a pair of wires and equipped with ordinary telephone sets, two composite telegraph channels, one carrier telephone channel and one carrier telegraph channel. By operating them all separately and then simultaneously, but only receiving one at a time, their simultaneous operation without interference was demonstrated.

ABERDEEN NOTES.

A REPRESENTATIVE gathering of the staff met in the District Manager's room on Aug. 14 to present Mr. W. D. Kay, Asst. Traffic Superintendent, with a standard lamp on the occasion of his marriage.

Mr. R. L. Forrester, Traffic Superintendent, presided, and the presentation was made by Mr. Stanley A. Young, District Manager.

Mr. A. Clow, Chief Clerk, and Mr. H. J. H. Webb, Asst. Traffic Superintendent, spoke on behalf of the Accounts and Traffic Departments.

Mr. Kay suitably replied.

HOW TALK BEGAN.

BROWSING among some old American magazines, the writer recently came across an article which may be of interest to telephonists if nobody else.

The item is headed "How Talk Began," by Sir Richard Paget, and contains a very ingenious theory.

On good authority, we are told that man has led a separate existence on this planet for something like two million years. The beginnings of his invention of the art of speech are, therefore, almost unimaginably remote. Yet it is possible, by the study of speech, even as we have it to-day, to form some idea of how it began. By experiment as to the actual nature of the various speech sounds and by comparing the sounds with the "posture" or "gestures" of the tongue, lips, and other vocal organs, a rather surprising conclusion is reached.

Sir Richard continues: Let us imagine that man, in his most primitive state of civilisation, behaved not unlike the higher animals now, and that he expressed his emotions by emotional cries and explained himself by gestures of his face and limbs generally. As he became more and more engrossed in the arts and crafts—chipping flints for knives, axes, and arrows; pursuing the chase; making bone needles; piercing shells for the use and ornament of his lady friends, and so on—his hands would obviously become more and more occupied. It became inconvenient to be always using his hands to "explain" himself: he tended to make his sign language more with his face and, finally, with his mouth and throat.

We are asked to presume, therefore, that man started to speak by imitating with his tongue and other vocal organs the gestures which he had previously made with his hands, or, rather, with his hands and face together.

His old original gesture for "little" would be to represent something small with his hands. His corresponding speech gesture would therefore be to make a small mouth, bringing his tongue forward near his lips and partly closing his lips so as to make a small cavity. His hand gesture for "big" would be one that represented something big: so his speech gesture would be to make a big mouth, with large opening of the jaws and tongue far back.

To represent the idea of "dig" or "digging" our primitive friend would no doubt try to dig with his tongue. In conveying the idea of "shaking," like shaking a mat, the tongue is just shaken up and down inside the mouth so as lightly to touch the roof of the mouth and the floor of the mouth behind the upper and lower teeth alternately.

If the reader experiments for her, or himself, they will see what kind of spoken word results when the gesture is accompanied by a humming sound made by their vocal chords to act as the "carrier wave." The little mouth now makes a "act" like "ee-ee" or "ii-ii" (as in French) according to the extent to which we close our lips. The big mouth makes a word like "aw-aw" or "oh-oh," in the same way. The digging gesture sounds like "tah-dee" or "tah-ree": while the shaking gesture makes "olly-olly" or "orry-orry."

Dr. Neville Whyman—an expert on the Polynesian, Japanese, and Chinese languages—brought this interesting fact to Sir Richard's notice, that in certain early forms of those languages the word for little is "i-i" (pronounced "ee-ee"); big, "o-ho"; dig, "tadi" (pronounced "tah-dee"); shake, "ore-ore" (pronounced "orry-orry").

Then, again, we are requested to take the words "apt" or "adapt," which are derived from the Aryan root "ap," meaning seize. What is this, asks the theorist, but a seizing gesture, a sort of snapping, made with the lips and jaw? Our word "car" comes from the Aryan root *kar* or *kal* (R and L are caused by very similar tongue gestures), meaning to move, speed, run, he says. Another root of the same sound means to curve or to roll, whence our words "circus," "circle," &c. In these and many other words the consonant L, which is produced by a rapid flick of the tongue,

denotes movement of some sort: while R, which is a similar gesture but with a certain amount of bending back of the tongue, denotes bending, binding, or enclosing.

It would appear that about one in every seven or eight of the Aryan roots listed by Dr. Walter W. Skeat in his well-known Etymological Dictionary of the English language will be found to bear traces of this same method of formation. The tongue and lips performed the appropriate symbolic gesture, and a "call," made by the vibration of the vocal chords inside man's Adam's apple, converted the gesture into the spoken word.

W. T. L. (T.S.).

(With grateful acknowledgments to both magazine and author.)

AFFORD A TELEPHONE, AFFORD A CAR!

W. T. LOWE.

PRESUMABLY it is an unwritten law in business circles that any particular firm does not mention competitors' names whilst boosting the qualities of their own goods.

Thus we see a picture of a bluff, hale, and hearty individual who says "Mine's a Worthington"; and, occupying an adjacent space on the hoarding, another apparently just as healthy, tells us that he "prefers a Bass." It is quite obvious that these advertisements are not at the expense of one or the other. No names—no packdrill.

It would appear, however, that although the Department must not look upon itself as a money making concern; must not compete with private enterprise; in fact, must not do anything other than that which the Press might decide, it is open to the type of criticism at which the business world looks askance.

Of late, much has been heard of the wonderful competition of cable companies from Liverpool to London via New York against the Inland Telegraphs. The writer not only claims to know something of this legend, but can inform the reader that the stunt was manufactured more than a quarter of a century ago. It is now becoming a little tarnished. The point is, that in reporting these feats, the Post Office is quoted as the inferior party. What would happen if the brewers of Bass were to say "Worthington is no good, I prefer a Bass"? or, if the Press gave a free advertisement (!) and said the same?

Cable companies boost their respective services, but did one ever hear of the Commercial disparaging his rival, or vice versa?

One of the most extraordinary examples of commercial publicity at the expense of a Departmental service was recently embodied in the following paragraph culled from a periodical:—

"A coupon was included in the advertisement and all you had to do was sign your name and give your telephone number to make an appointment. Anyone owning a telephone is probably in a position to buy a car, and also the making of the appointment would provide an opportunity for a little sales talk."

Reversing the assumption we may safely conclude that anyone who already owns a car, can afford to have a telephone. Here scope would appear to be offered to Contract Officers at every traffic jam. It would be interesting to know the number of car owners who are not subscribers.

[We do not altogether agree with our contributor that the advertisement referred to is "at the expense of the Post Office," but the idea that anyone who can afford a telephone can afford a car, certainly strikes us as amazing!—Ed., T. & T. J.]

READING NOTES.

MR. FRAME, referred to in the August Reading Notes as Assistant Traffic Superintendent, should have been described as "Traffic Superintendent II."

TELEGRAPHIC MEMORABILIA.

It is a great pleasure to be reminded of the continued activities of the veteran French Inspector of Posts and Telegraphs, Monsieur E. Montoriol, who, more than a quarter of a century ago, so thoroughly and so graciously taught certain members of the Cable Room staff, C.T.O., the manipulation of the Baudot multiplex, and so thoroughly grounded us in the technical intricacies of that system. He it was who convinced the then authorities in this country of the necessity of the *dirigeur*, i.e., a thoroughly qualified technician who at the same time was a manipulative expert. M. Montoriol gave a lecture on "Les Derniers Perfectionnements en Télégraphie," a month or two ago which has since been published in *Les Annales des Postes Télégraphes et Téléphones*. Our old friend insists most emphatically that the telephone is not "an enemy" of the older system of communication. He goes even farther and insists that it will not even eventually displace telegraphy. One proviso he makes, viz., that the modern demand for rapidity of service shall be met. If this be thoroughly done, he sees no reason why the two systems should not live side by side "each in its own special domain." In further insisting upon increased speed, to the last mentioned he would add, increased reliability and lower cost. "It is the job of the technician," he continues, "to produce more rapid methods of transmission, to reduce the cost of operation by a better use of lines and apparatus, and to enable the staff to do more with less fatigue." I have taken the liberty of italicising the last condition laid down, but it is encouraging to find so well-qualified and so long-experienced a judge declare, that the limits of technical improvement have by no means yet been reached.

Personal.—It is interesting, whenever possible, to watch the career of men and women colleagues in the Post Office Telegraph Service, who have left the latter, some in the early, others at a later, period in their career. The retirement within the last month or two of Mr. R. J. Hughes from the position of Plant Manager in England for the Commercial Cable Company, is a worthy example. Mr. Hughes was initiated into the mysteries of Telegraphy in the Liverpool P.O. in the 'seventies, but when thoroughly qualified as an operator joined the Direct United States Cable Co. at Ballinskelligs, transferring to the Eastern Telegraph Co. at Porthcurnow, making his final change of masters at the inauguration of the Commercial Cable Co.'s working at Canso. From 1900, when Mr. Hughes was appointed Superintendent of the then new cable station at Fayal, he has been in closest touch with every "latest" development in submarine cable transmission and reception, including the Heurtly magnifier. The retirement of Mr. Hughes was graciously recognised in the metropolis by the whole of the combined officials of the London office.

Mr. and Mrs. G. H. Hickman celebrated their golden wedding at Penge on Aug. 29 last, and the congratulations of many of his old colleagues are affectionately tendered to G. H. H. and his worthy partner. Mr. Hickman will be remembered as Asst. Supt., Telegraphs, T.S., who retired in 1917. What is perhaps less generally known is the fact that he was also a prominent Burgess of Rye, Sussex.

Obituary.—It is with great regret that we have to record the tragic death of Mr. J. W. Francis, at Southsea, a week or two ago, when he was knocked down by a vehicle while crossing the road. Our old colleague originally came from Alverstoke, and for some years past has spent several weeks in and around that neighbourhood. He served the first five years of his telegraphic career in the Eastern Telegraph Company and transferred to the Government service in 1870, retiring at the age-limit in 1911 as Superintendent in the C.T.O. He was one of the special contemporaries of the late Messrs. T. E. Newing and W. Barnett, and also of "The Archbishop" (Mr. W. J. Twyman), who is still with us. Though Mr. Francis had all but completed his 80th year, he retained all his faculties to the last, and remained ever that gentle soul by which he will always be remembered.

Countries.—ALGERIA.—Factories, says *The Electrical Review*, for the manufacture of telegraph and telephone cables have

recently been established at El Alia, Algeria, by the Société des Lignes Télégraphiques et Téléphoniques Nord-Africaines. The new works are engaged on the manufacture of a cable to be laid between Oran, Algiers, and Constantine, and have lately received an order for a cable between Casablanca and Rabat, Morocco. AUSTRALIA.—According to the *Sydney Morning Herald*, the Secretary of the Chamber of Manufacturers made a strong protest against the ordering of radio apparatus abroad by the Commonwealth Postmaster-General. Mr. F. Edwards, the secretary above mentioned, stated that while the importation of radio receiving apparatus into Australia had been banned, there was no restriction on transmitting apparatus. The Australian manufacturers had been able to supply similar apparatus to the New Zealand Government against world competition, while the Postmaster-General had sent orders abroad for over £200,000 worth of apparatus. The Australian radio manufacturers, it was further contended, were spending more than £10,000 a year upon research and were capable of producing all the apparatus essential to the commercial radio services throughout Australia and the Pacific. In spite of this, so it is maintained, "they were not given a chance to quote for the five broadcasting relay stations which were the subject of the present orders." A paragraph in *The Electrical Review* of Aug. 15 gives the following details of the placing of the contract which formed the subject of the vigorous protest: "The P.M.G. of Australia announces that he has accepted the tender of *Standard Telephones and Cables (Australasia) Ltd.*, for five radio relay transmission stations. The contract price is £71,670 and a Customs duty of £14,943. The tender of the Australian firm of Amalgamated Wireless Ltd. was £127,208, plus Customs duty of £3,614. The Standard Company will obtain a considerable portion of the apparatus, it is understood, from its overseas principals. The five stations will be erected near Newcastle, Rockhampton, Warwick, in the district between Albury and Corowa, and in the vicinity of Port Pirie. *Telegraphic data.*—Mr. H. P. Brown, Director of Australian Posts, Telegraphs and Telephones, has made available a return giving the annual *per capita* number of telegrams for the various Australian States, thus: W. Australia 4.7, Queensland 3.15, S. Australia 2.7, New S. Wales 2.55, Victoria 2.45, and Tasmania 2.3. BELGIUM.—The Belgian Chamber has approved the bill which proposes to convert the State telephone and telegraph systems into an independent company, under the title of the *Regie des Télégraphes et des Téléphones*. There will still be a Minister responsible for these services, under whose jurisdiction will also remain matters concerning wireless communication in general. In fact three separate laws have recently been passed concerning the latter matter which includes the creation of a Belgian National Wireless Institute. The Institute will have the use of three wavelengths, says *World Radio*, to be determined by the Government, and is to be conducted "in an impartial manner without publicity broadcasts." The Minister will be assisted by a council of nine members of Belgian nationality. Three of these will be selected by the King, three by the Senate, and three by the Chamber of Representatives. The sources of revenue are laid down in the following order: (a) Gifts or legacies; (b) loans guaranteed by the State; (c) taxes on receivers and on the sale of valves; (d) grants from the State and public bodies; and (e) the sale of publications and profit on contracts into which it may enter. A Government credit for the current year of £45,700 has already been granted. The annual tax on receivers other than "crystals" is about 34s., the fee for the latter is to be 11s. 6d. BRAZIL.—*The Companhia Radio Internacional de Brazil*, an associated company of the I.T. & T. Corp., has been granted a concession to construct radio stations and carry on international radio-telegraph and radio-telephone services from Brazil. Stations will be installed to give telephone service to the U.S.A. and Europe, as well as other countries connected to the international network of S. America. The radio-telegraph service will be established to all parts of the U.S.A. via the Mackay radio station at Sayville, and with Brazil, Argentina, Columbia, and Peru, through the radio stations of the international systems. The concession is renewable and covers ten years. CANADA.—The ten recommendations made at the Aviation Radio Conference, in New York City, on April 10 and 11, between representatives of Canada and the U.S.A., whereby frequencies set

aside for aviation will be used mutually by aircraft of the two nations were adopted in August by the Federal Radio Commission. The Canadian Government recently announced its ratification of them, and now planes flying from Canada into the U.S.A., or vice versa, may continue their radio operations on the same channels on crossing the border. **CURACAO.**—More telegraph facilities will become available shortly through a new cable about 240 nautical miles long, to be laid from Willemstad (Curacao) to Maracaibo, Venezuela, says Reuter's Trade Service from Caracas. It is anticipated that the cable will be in operation during the present month. It is also proposed to lay a new line from Maracaibo to Barranquilla (Colombia). The new cable will give direct communication with the rest of the world. **CHINA.**—Reuter's Nanking agency states from a Chinese source that, as regards the conference meeting in that city between representatives of the Great Northern, Eastern Extension and Commercial Pacific companies, it is understood that the foreign companies have agreed to the general principles laid down by the Ministry, including the cancellation of the *exclusive* privilege of landing cable lines as well as the supervision and regulation by the Government of the transmission and reception of telegrams. **DUTCH EAST INDIES.**—There is, or at any rate has been, some considerable dissatisfaction in this group as the Government has stepped in and is reorganising the broadcast services so as to make them independent of personal agreements between the distributors and owners of receiving sets. The Government proposals are to fix a maximum quarterly fee of 16s. 8d. for a single and the same for each additional set on the same serial, "while for meeting-rooms, clubs, hotels, restaurants, &c., &c., the quarterly payment should be £10. "The money is to be collected by the Government which itself will decide in what proportion the cash is to be divided, after consultation with the Netherland Indies Radio Broadcast Co. The Government and the Company are also to co-operate in the provision of better stations and more complete reception from Holland and other European lands. "Should agreement between the Government and the Company be reached," says *The Electrical Review*, "a concession to the Company for a period of ten years will be granted." **FRANCE.**—*French Colonies and Wireless.*—A commission of 18 members has been appointed for four years to advise the Colonial Minister technically. At the first meeting of this commission, it is reported that, by an unanimous vote, the establishment of a temporary station in the grounds of the coming Colonial Exhibition was recommended. The exhibition is to be held at Vincennes next year, and the temporary station is to be used for telegraphic transmissions to the French colonies. This temporary station is to be followed later on by the installation of a more permanent structure in Paris. **GERMANY.**—The Exchange Telegraph Agency is responsible for the statement that "The Reichspostamt is considering the introduction of a telephone apparatus which automatically writes down what is said, and that it is a sort of tape machine attached to an ordinary telephone. Unless memory is much at fault, this is not the first time that auxiliary apparatus, in the shape of a dictaphone, has been used in connexion with the telephone. Something of the kind was done in Paris some eighteen months or more ago. An American scientific journal only recently cited the case where a Birmingham (England) firm and their New York agency negotiated a contract over the transatlantic telephone using a dictaphone in order to verify certain important data. So successful was this reported to have been that the discs are in future to be filed with other documents relative to this and subsequent similar telephonic communications. *Unemployment!*—Reuter's Berlin agency informed us recently that the German Post Office has now given contracts to the value of £10,000,000 to various firms which have offered to provide the material and carry out the work at prices about 10% below market figures. These contracts are estimated to provide work for no less than 125,000 men. The linoleum trusts, it is stated, refused to reduce their prices, so the Post Office has arranged to dispense with the use of linoleum in the new buildings, and to make shift with bare boards! **GREAT BRITAIN.**—*Fleetwood.*—Two steam trawlers belonging to the Iago Steam Trawlers Company, Ltd., have recently been fitted with wireless-telephone sets at Fleetwood. The telephones have a day radius of 250 miles, and a radius at night

of about 500 miles. **Dundee.**—The Town Council has refused an application for permission to install a radio-relay service in the city. The erection of private lines across the street was the principal cause of objection. The "radio-relay" service referred to is, of course, a "wireless exchange," such as those in use at over fifty other towns in the United Kingdom, and mentioned in the House of Commons by the Postmaster-General on July 22 last. *The Electrical Review* states that the construction of the Northern Regional station buildings and the erection of its aerial masts are well advanced, and that "test transmissions may be expected this month." "The Moorside Edge, Slaithwaite, station's masts," the *Review* goes on to say, "are taller, and its service area larger than those of the London station. It is all but certain that there will be some wavelength changes in connexion with the inauguration. *Television.*—The Television Society was registered as a company *limited without share capital*, with a maximum of 1,000 members, each liable for £1 in the event of liquidation. The omission of the word "limited" from the title is authorised by licence of the Board of Trade. The management is vested in a council of twenty. The B.B.C., at the request of the International Broadcasting Union, adopted a new power rating for its transmitters. The actual power of all its stations will remain as before and the change is actually due to recognition of a new international method of computation. The actual power at Brooklands Park, for example, will remain unaltered, but its power rating has been changed from 30 kw. to 45 kw. The new system of computing the power of a broadcasting station takes account of modulation, which formerly in this country it did not do. **INDIA.**—In view of the fact, says *The Electrical Review*, that certain proposals are before the Government regarding the establishment of a wireless telephone service between Bombay and Great Britain, the Director-General of Posts and Telegraphs, India, recently consulted the Bengal Chamber of Commerce with regard to the need for and utility of such a service. The latter expressed the opinion that the service would meet with considerable success provided that clear and good results could be obtained. **IRISH FREE STATE.**—It is understood by *World Radio* that, beginning on the 20th of the present month, an experimental programme sponsored by advertisers will be broadcasted from Dublin and Cork, but will be limited to one hour each evening. **ITALY.**—*Is elimination of atmospherics in sight?*—The Italian Broadcasting Company has been experimenting with the invention of a young Genoese, named Signor Bruni, for the elimination of atmospheric and electrical disturbances affecting wireless transmissions, and has placed a transmitting station at the disposal of the inventor for further experiments. *World Radio* states that representatives of the Navy and Army, as well as those of the company, have expressed their satisfaction at the results achieved by the apparatus of this young man of 21 years. **JAPAN.**—Mr. Kachichi Uchida, president of the Japan Wireless Telegraph Co., has arrived in Australia with the object, says *The Electrical Review*, of linking up the Commonwealth with Japan by means of Beam wireless. Mr. Uchida is a pioneer of wireless communication in Japan. **MONGOLIA.**—*The old world moves!*—*The Electrical Review* places on record the alluring information that "The Mongolian and Tibetan Affairs Committee has formulated a programme for improving communications in Mongolia for submission to the forthcoming Mongolia and Tibetan Affairs Conference. The project provides for the erection of radio broadcasting stations and the installation of long-distance telephone services. **PERSIA.**—Reuter's Teheran agency reports that negotiations are in progress between Persia and Italy, France, Germany, the United States, and other countries, with a view to the establishment of regular wireless-telegraph communication between them and Persia. **POLAND.**—It is expected that the new LVOV 16 kw. broadcasting station will commence its experimental transmissions about the middle of the present month. **ROUMANIA.**—The Post, Telegraph, and Telephone Administration of Roumania has estimated that there are nearly 100,000 wireless receiving sets in that country. Unfortunately, only 40,000 of these are paying the tax! The Administration have come to a curious decision, so it would appear, for the initial subscription and the annual tax are both to be reduced, the former to 100 lei (2s. 6d.) and the latter to 300 lei.

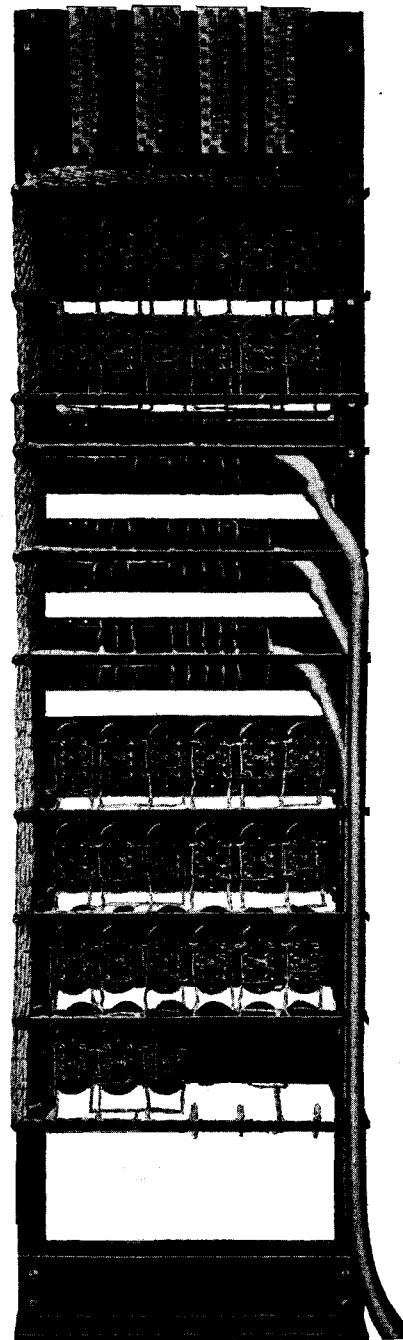
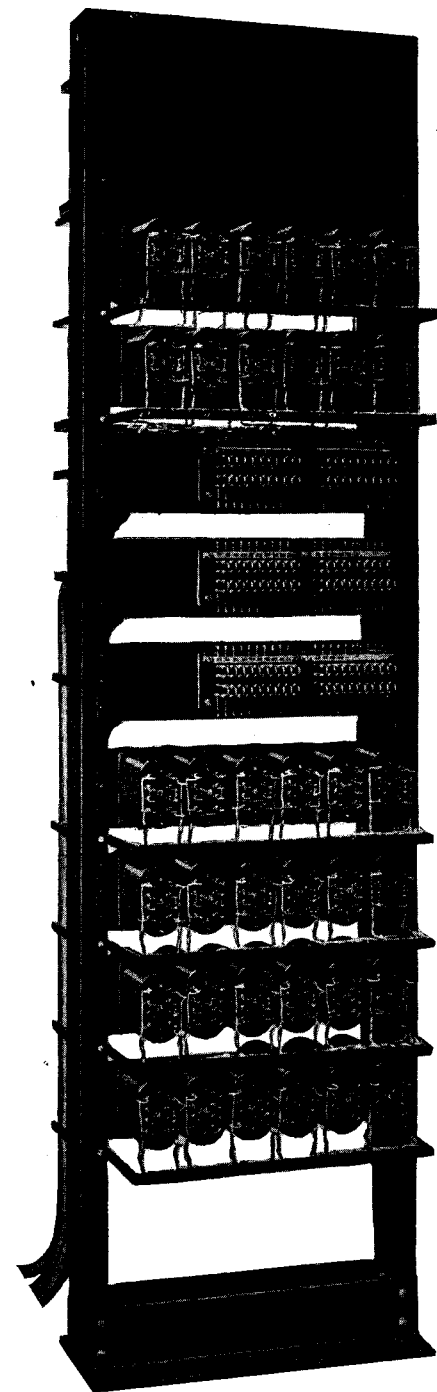
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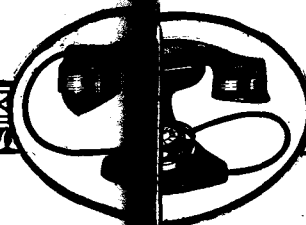
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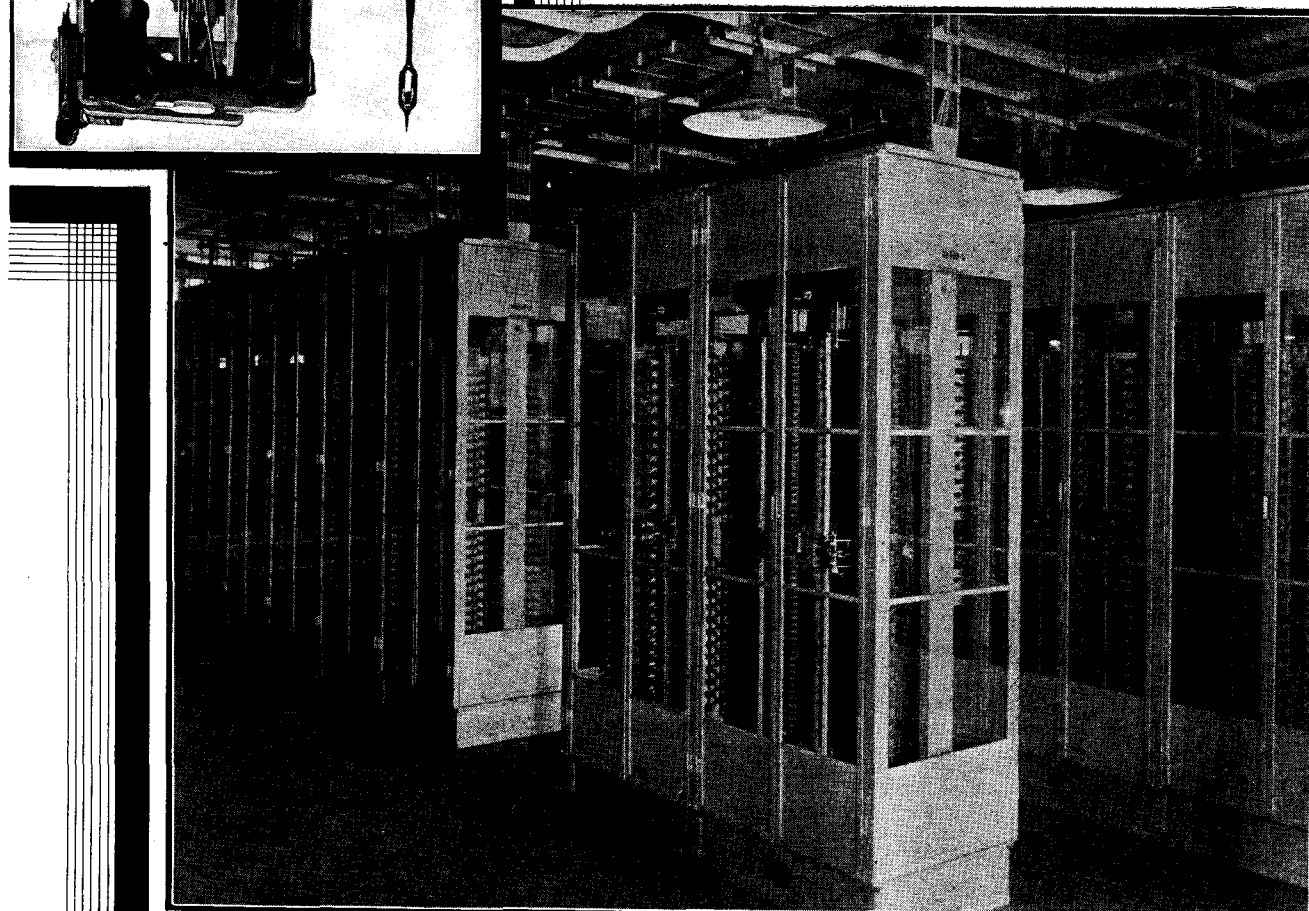
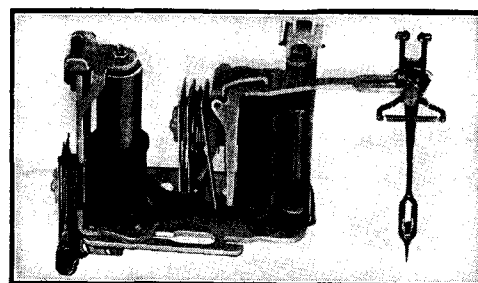
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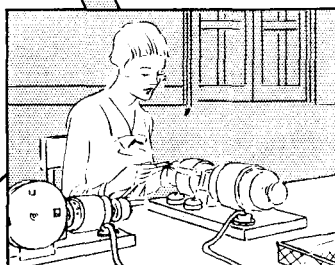
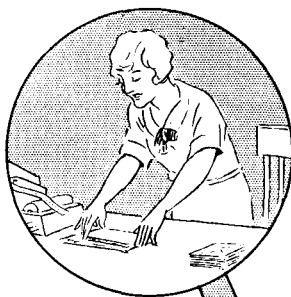
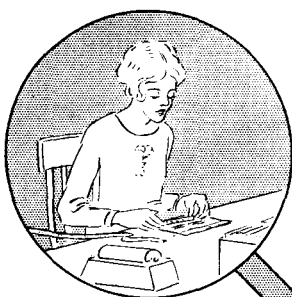
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STROWGER AUTOMATIC



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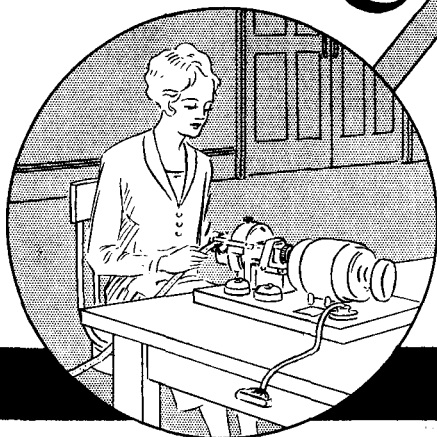
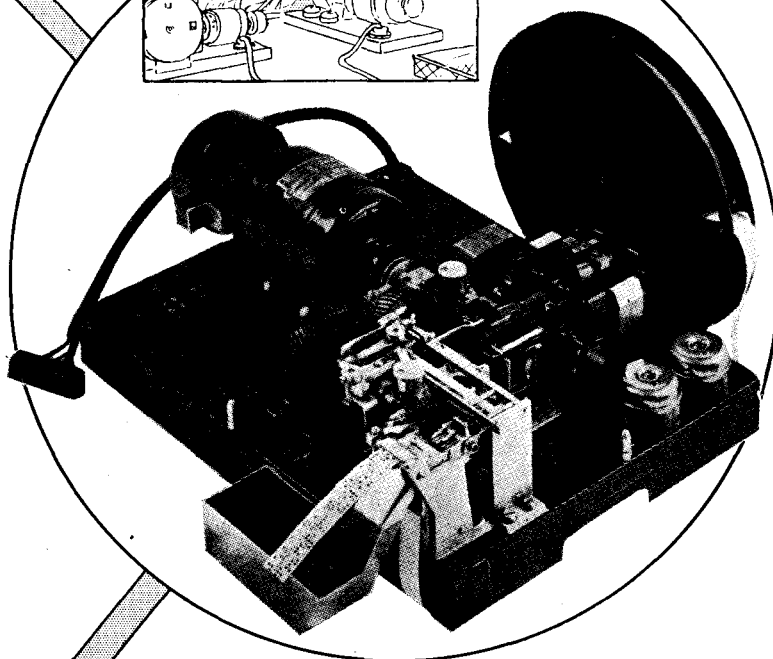
It reproduces the signals transmitted from a Teleprinter Keyboard or Automatic Transmitter in the form of perforations in a paper tape. This tape is a facsimile of that prepared on a Keyboard Perforator for use with the Automatic Transmitter.

The message so received is transmitted to another station by merely passing the tape through a Teleprinter Auto-Transmitter. This avoids the necessity of re-transmitting a message by hand.

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Write for full details.



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One can only hope that the 40,000 good men and true who have been honestly paying the higher fees will be rewarded by a suitable "refund"! **RUSSIA.**—The Moscow correspondent of the *Daily Telegraph* reports that Professor Vise, chief of the Soviet Arctic expedition, has recently sent a radiogram from the icebreaker *Sedor*, already mentioned in these columns, or it may be from one of the short-wave installations on shore, the material for which the expedition was provided. In any case, the position given in the radiogram was in the neighbourhood of latitude 79 degs. 25 mins. north and longitude 70 degs. 16 mins. east, where "new land" is reported to have been discovered. It is not necessary in these pages to stress the immense utility of radio communication! **U.S.A.—Bridge-building and wireless.**—A proposal to build a bridge across the Hudson River at 57th Street, Manhattan, was acknowledged to be a much needed improvement, and one which would to no small extent ease the daily growing traffic congestion. A curious question cropped up, however, when the practical details were being worked out. There are, it appears, more than forty vessels which regularly use this part of the Hudson, the heights of which exceed 180 feet. From an engineering point of view there was, of course, no insurmountable difficulty in designing a bridge to meet all traffic at a high level except the very heavy additional expense of the necessary lengthy approaches thereto. A bridge of lower level was decided upon, with the proviso that all vessels using that portion of the river should be fitted with telescopic masts which could be lowered when necessary. This would certainly prove cheaper than the high-level bridge even if the port authorities were to pay for the necessary alterations. Then up spake the modern mariners, who gave evidence of "the radio effect on board ship of the lowering of the antennae supports." They were backed up by radio experts and in turn were faced with other radio experts with other views, and when my informant last communicated with me the matter was still a case of "to be or not to be." *World Radio* informs us that engineers in the U.S.A. have been testing with 200 kw. of aerial power for broadcasting. The transmitter is situated at a radio laboratory a few miles south of Schenectady, where facilities are available for the power requirements of a large number of transmitters. There are four steel aerial towers, three 300 ft. high and one 150 ft. high, and, in addition, a large number of small masts, between all of which are rectifiers capable of supplying 750 kw. of d.c. at 20,000 volts. In the 200 kw. transmitter there are six 100 kw. power valves. Each is 5 ft. long or 7½ ft. including the water-jacket.

Americanisation.—To me, as a good American, there is nothing more profoundly repugnant than the idea of the Americanisation of the world.—Professor R. B. Perry.

J. J. T.

THE POST OFFICE TELEPHONE AND TELEGRAPH SOCIETY OF LONDON.

SESSION 1930-1931.

AN interesting and varied programme has been arranged by this Society for the forthcoming Session. The meetings will be held, at 5.30 p.m., at the Institution of Electrical Engineers, Victoria Embankment, W.C.2. Mr. W. H. U. Napier (Controller, London Telephone Service) will be the Chairman for the Session. Prior to each meeting, from 5.0 p.m. to 5.30 p.m., tea and light refreshments will be provided for members and visitors in a room adjoining the Lecture Hall.

Particulars of the meetings during the Session are as follow:—

1930.		
Monday.		
Oct. 20.	"Notes of Visits to European Wireless Stations."	Mr. A. H. Read (Secretary's Office, G.P.O.) and Mr. R. G. De Wardt (Engineer-in-Chief's Office, G.P.O.).
Nov. 17.	"Post Office Engineering Contracts."	Mr. G. W. Bell (Engineer-in-Chief's Office, G.P.O.).

Dec. 15.	Open Debate: "How to Improve Telephone Development."	Discussion will be opened by Mr. M. C. Pink (Deputy Controller, London Telephone Service).
1931.		
Monday.		
Jan. 19.	"Long-Distance Telephony in U.S.A."	Mr. W. C. Griffith (London Telephone Service).
Feb. 16.	"Telephone Finance."	Sir Henry N. Bunbury, K.C.B. (Comptroller and Accountant General, G.P.O.).
Mar. 16.	"Engineering and Traffic Aspects of Teleprinter Development."	Mr. A. P. Ogilvie (Secretary's Office, G.P.O.) and Mr. F. W. Dopson (Engineer-in-Chief's Office, G.P.O.).
April 20.	"Characteristics of Radio Communication."	Mr. A. J. Gill (Engineer-in-Chief's Office, G.P.O.).

By permission of the governing bodies, members of this Society may attend meetings of the Post Office Institution of Electrical Engineers and of the London Telephonists' Society.

All members of the staff of the Post Office are eligible for membership on approval by the Committee. The annual subscription, payable in advance, is 1s. 6d. for ladies and 2s. 6d. for men. Application for membership should be made to the local agent, or to the Hon. Secretary, Mr. A. J. Wadey, Secretary's Office, G.P.O. (North), E.C.1 (Central 3600, Extension 768).

MIDDLESBROUGH DISTRICT NOTES.

Opening of the New Post Office at Redcar—Civic Ceremony.

THE opening of Redcar's new post office on Monday, Aug. 11, was marked by the glorious weather which is usually experienced at this popular resort.

The opening ceremony was performed by the Mayor (Alderman W. Metcalf), who was accompanied by the Mayoress, Alderman Mansfield, M.P., Mr. R. McClean, Town Clerk, several members of the Town Council and a large number of the general public.

Mr. J. A. Humberstone, the local Postmaster, presided, and other Post Office officials present were: The Surveyor of the District, Lt.-Col. Hobbins, C.B.E., Mr. J. Haig-Smith, O.B.E., Assistant Surveyor, Messrs. B. A. Burton, Head Postmaster, and W. Morton, Superintendent, Middlesbrough and Stockton-on-Tees, F. H. Woodrow (Telephones), H. J. Hesford, Head Postmaster, Saltburn-by-Sea, J. Knox, Head Postmaster, Whitby, W. R. Owen, Head Postmaster, The Hartlepoons, J. C. Emmerson, Postmaster, South Bank, F. Salt, late Postmaster, Redcar, and representatives of the Middlesbrough Branch of the C.O.A., and local branch of the U.P.W.

Miss O'Neill, S.C. & T., acting for the staff, presented the Mayoress with a bouquet.

After his party had inspected the office, the Mayor entertained the Post Office visitors to a luncheon at the Swan Hotel, where, after the loyal toast had been duly honoured, the toasts of the "Postmaster-General," proposed by Mr. R. McClean (Town Clerk), and responded to by Mr. T. P. Hobbins (Surveyor), and "Redcar," proposed by Mr. B. A. Burton (Head Postmaster), and responded to by the Mayor, were heartily received.

A vote of thanks to the Mayor was moved by Mr. J. Haig-Smith, and this concluded a very happy and memorable occasion.

An up-to-date central battery system telephone exchange is to be housed in the new building, and its completion is anticipated in October.

FOR OUR ADVERTISERS.

Australia, Melbourne. Oct. 14. Supply and delivery of condenser (Ref. A.X. 10,004). *South Africa*, Cape Town. Oct. 16. City Electricity Department (A.X. 10,162). *Lawrence Marques*. Oct. 17. Supply and installation of automatic signalling system on the Ressano-Garcia line (Ref. A.X. 9,971). *New Zealand*, Wellington. Nov. 5. (P. and T. 151/2532) (Ref. A.X. 10,170).

In addition to that mentioned in last issue regarding the Brazil market, a confidential report on the market or primary and secondary batteries in South Africa has also been prepared by the Department of Overseas Trade, from information furnished by the British Trade Commissioner in South Africa, and is issued to firms whose names are entered on its special register. United Kingdom firms desirous of receiving a copy should communicate with the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1 (Ref. A.X. 9,944).

Reuter's Trade Service from Montevideo reports that a Presidential decree modifies a former one regarding import duties, and that the new rates on radio apparatus are 46%, plus surtax of 14% of the official valuations, which range from 0.80 to 1.80 pesos per gross kg.

J. J. T.

CORRESPONDENCE.

"IN THIS CONNEXION."

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—Those who have an affexion for the English rendering of words without detraxion, and an objexion to Americanese, will find on inspexion and retrospexion that a certain faxion has recently taken axion in the direxion of the extinxion of "et" and the use of "x."

Strange to say, this attraxion for reduxion in letters has resulted in the extraxion of only one little word from those available in the dixonary for such distinxion, viz., "connection."

After reflexion and introspexion I confess a feeling of distraxion, abjexion and helpless inaxion when I see the infexion spreading in all official direxions. Risking contradixion and ignoring interjexions, I urge that such dixon is not the acme of perfexion and that at least a fraxion of circumspepxion should be exercised in the selexion of letters for word construxion.

Let those who have a predilexion for a collexion of new forms use the word "connexion," if they wish, in private transaxions, but give us your protexion, Mr. Editor, and retain in public print our English word "connection," which, like "connected," is an extension of the word "connect" (not connex).—Yours faithfully,

H. G. SELLARS.

[Whilst we print Mr. Sellars' humorous protest, we would point out that spellings like "connexion" and "inflexion" have no connexion with what he calls Americanese. Reflexion, connexion and other similar words admit of alternative spellings because their Latin root-words change in the preterite from et to x—flecto, flexi; necto, nexi, &c.—whereas 'affection' and 'objection' are a horse of another complection (as we recently saw it spelt in Congreve)! It is true that although the root words of diction, reduction, and some others have a preterite in x, the dictionaries do not admit "dixon" or "reduxion"; hence Mr. Sellars' protest has considerable point.—Ed., T. & T.J.]

HOW TO DEVELOP THE TELEPHONE SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

The present poor showing of Great Britain as regards telephone density to population, compared with other countries, is a matter which gives concern to many persons employed in the telephone industry. It should be the aim of all to endeavour to find the cause, and then to seek a remedy.

One hears frequently that the chief reason is the natural conservatism of the British public. This statement is often said in such a way as to imply that the conservatism belongs to the man in the street, and therefore is something for which we telephone folk are not responsible.

If, however, you consider the statement carefully, it will be brought home to us that telephone officers are members of the British public. It therefore behoves us all to ascertain whether our own personal and official innate conservatism is not involved.

The telephone habit has to-day become such that it will be generally conceded that no business or professional man can possibly afford to do without a telephone. As a rule it is no longer necessary to spend much time in convincing them that the service is a prime necessity, and one of the first aids to efficiency in business.

I am convinced that in 20 years' time the service will be viewed in the same light by all classes, down to and including the lower middle classes, for residential purposes.

One of the first things we must do to bring about a rapid expansion of the service is to make this view prevail much earlier. If this is done, it follows immediately that the enormous number of small shopkeepers who are non-subscribers because most of their customers are not on the 'phone would, from self-preservation, be compelled to subscribe immediately.

It should be obvious that the more residential subscribers that can be obtained, the more necessary is it for the residential non-subscriber to have the service for social and other purposes. Thus the system is like a snowball, gaining weight by its own progress.

Anyone who has had a long experience in the Contract Department knows that it is far easier to obtain orders to-day than it was 20 years ago. The same thing will, without doubt, be true of the future.

Are we making the most of the rates which can be offered at present, particularly of the 2-party line rate?

There seems to be a general impression in the service that this class of circuit should be discouraged. Is this opinion well founded? Surely there are many thousands of potential subscribers who would be willing to pay £4 per annum. Is it possible to extend this class of service? It has never been clear to me why the restriction of the two-party rate to persons whose premises are outside the mile radius was allowed to remain unaltered, when the free radius for direct lines was extended to two miles.

It will, no doubt, be borne in mind that a general two-party line rate would have an enormous attraction for the smaller residential householders. It is thought that many of them would ultimately become direct-line subscribers, as their traffic grew.

I would suggest that consideration be given to the question of creating message rates. There may be some objection to a multiplicity of rates, but it is submitted that there are decided advantages.

The insurance companies' tables tend to prove this. They seem to go on the principle that if one rate does not appeal, then another may. The same may be said of the rates in force for telephone service in Hull, where the Corporation is responsible for the service.

I am convinced there is a large field waiting to be developed immediately if it were possible to offer service without a rental.

I therefore suggest that consideration be given to the following residential rates to be applicable to premises within two miles of an exchange:—

Two-party Lines.—Guarantee two calls a day at 2d. each.

Direct Lines.—Guarantee three calls a day at 2d. each.

Extra mileage beyond the two-mile radius to be paid in accordance with the existing rates.

The first would work out at £6 1s. 8d. per annum, as compared with £7 0s. 10d. at the existing rates, and the second to £9 2s. 6d. and £10 1s. 3d. respectively.

It should be borne in mind, however, that the guarantee in the number of calls would ensure a larger use of the 'phone, and thus encourage the telephone habit. It is also probable that the figures proposed are higher than the average revenue at present received on such circuits.

Further, as the calls from such circuits are usually put through outside the peak hours, the expense in the provision of additional staff, junctions, &c., is not likely to be so high as would be the case with business circuits.

Any Contract Officer working a residential area will confirm that such rates would have a tremendous attraction to many who will not look at the existing ones.

Such rates, coupled with judicious newspaper advertising, would, I am sure, help us to recover most of the lags in development figures in residential areas.

Are we sincere in saying the 'phone is an aid to efficiency? How many telephone officers with salaries of £500 per annum are subscribers? How many Contract Managers (who, above all persons, should be subscribers) are without a 'phone in their homes?

I would suggest that consideration be given to the question of allowing subscribers to rent automatic installations of a small size at a reasonable rental, or, alternatively, to allow them to buy their own installation when under 20 stations, and for the Department to take them over on maintenance terms, as in the case of larger installations.

It is understood that some of the automatic telephone manufacturers are offering small installations on hire purchase terms of about 2s. 6d. per week per station. The existing rates for automatic installations, say for 5 to 10 stations, compare very unfavourably with this.

It will, no doubt, be borne in mind that a system which obviates an operator for inter-communication must appeal much more strongly to the small subscriber than to the large one who is compelled, in any event, to employ an operator for exchange calls.

It is becoming obvious that the companies who are offering these facilities are securing the support of the public in an increasing degree.

I would also suggest that consideration be given to the question of taking away from the contract departments all clerical work, including development work, or, alternatively, that in the larger districts a Contract Manager, Grade 2, be appointed as second in command.

This would help the Contract Manager to give more time to the question of obtaining new business, and make him what he really is, namely, a Sales Manager.

Finally, I would suggest that promotion, either to the rank of Contract Manager, or Contract Officer, Class I, should be given to those officers who show outstanding ability in salesmanship. Other qualities are certainly necessary, but as salesmanship is the most important duty of contract departments, the senior officers should be outstanding in this respect.

CONTRACT OFFICER, CLASS I.

Bristol, Aug. 6 1930.

ROTATION v. SPECIALISATION.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—Mr. E. J. Wright, in his article on Rotation v. Specialisation in the September number of the *Journal*, raises a very interesting question and one upon which opinion is likely to be sharply divided. With the best will in the world there are many who will find it impossible to accept his dictum that "The result of restricting the workers' efforts to a narrow range of routine duties for lengthy periods is detrimental to the operative and even to the interests of the employer," or again, that "Initiative is destroyed

and a state of inertia set up until, ultimately, the man is reduced to a mere automaton," or again, when he charges specialisation with a tendency to "deadened thought."

I venture to suggest that the reverse of all this is true, and that employment upon specialised work has, speaking generally, a beneficial rather than a detrimental effect upon the individual; and this, it is submitted, is the natural result, since once the specialised task is fully mastered it is found to be more and more easy of fulfilment, the necessity for concentrated effort is reduced to a minimum and the strain upon the work is infinitely less. Moreover, this is so whether the work be of a mental or of a manual character. How is it possible to contend that (apart from exceptional individuals) the enjoyment which a man derives from his work is heightened by the necessity for him to reorientate "himself mentally and physically to a multiplicity of tasks. There are times when we are all apt to say that work is an unmitigated bore, but so, also, is life without regular occupation, and the happiest person is he who has learned the secret of achieving the maximum of efficiency with the minimum of effort.

If Mr. Wright's contentions are sound, it follows that the power to enjoy life, as well as the cultural standard of the working classes in this country, must have suffered a marked deterioration during the past 60 years. Every thoughtful observer agrees that the reverse of this is true, and that the standard of culture and refinement is very much higher to-day than at any previous period in our history.

Obviously, other factors—education, wages, hours of labour, &c.—have contributed to this result, but the fact remains that there is no evidence to show that the progressive increase in specialisation during the past 60 years has had a deleterious effect upon the worker.

It is true that the craftsman who produced the piece of furniture which has remained a joy and delight to successive generations accomplished work of a much higher order than his prototype of to-day, but we have to remember that he achieved success at the cost of an immense amount of concentrated labour and by the expenditure of much "blood and tears." His descendant who specialises on the feeding of standard lengths of whitewood through a mortise machine is excused all save the bare minimum concentration of mind and hand and leaves his work fresh in mind and in body, ready for the hundred and one activities which occupy the leisure of our manual workers to-day.

The idea that specialised work is necessarily uncongenial is disproved by the fact that the vast majority of men ask for nothing better than to be allotted their respective tasks and permitted to get on with them; specialisation makes for confidence, and confidence in his ability to fulfil efficiently his appointed duty is at the very root of all true enjoyment which a man finds in his labour.

It is not claimed, and so far as I am aware, never has been claimed, that specialisation is a panacea for all our social ills. What is claimed is that it results in lower costs and increased efficiency, while at the same time lightening the burden upon the mind and body of the worker.

Mr. Wright is on safer ground when he suggests that specialisation has a tendency to encourage secondary and extraneous interests, which are sometimes found to be in conflict with the interests of the employer, but the remedy should be sought elsewhere than in the setting aside of a method the value of which has been incontestably proven; moreover, the very admission that such secondary interests are apt to obtrude, itself disproves the charge that the specialised worker is being reduced to an automaton. Nature abhors a vacuum, and the mind at leisure from itself is never wholly void.

Your contributor's suggestion that some compensation should be paid to a man in respect of his versatility and wider knowledge is not altogether clear; if it means that a man who, because of outstanding ability, or special aptitude, has been selected for specialised work, is to be penalised vis-à-vis colleagues of his own class, then it would seem to be something less than just.

Mr. Wright concludes his very able article with a few animadversions upon the vexed and difficult subject of promotion—arriving at the conclusion that the specialist is under a severe handicap as against his confrère with wider knowledge and experience.

We would probably all go so far as to agree that where two claimants upon the vexed and difficult subject of promotion—arriving at the conclusion that the specialist is under a severe handicap as against his confrère with wider knowledge and experience.

No sensible person wishes to decry the great importance of experience, or to minimise the value of knowledge, but the determining factors in considering a man's claim to promotion should be neither experience nor yet knowledge, but *merit and ability*. Given that a man possesses genuine ability, all experience goes to show that he will make good even though he has been withdrawn from duties of a general character over a long period of time.

In conclusion, may I, while expressing warm appreciation of Mr. Wright's article, and while declining to emulate the "firefly," remind him of those other wise words: "They also serve who only stand and wait"?

"MENSANO," C.T.O.

Sept. 17, 1930.

REVIEWS.

"*A Text-Book of Sound: An Account of the Physics of Vibrations, with Special Reference to Recent Theoretical and Technical Developments*," by A. B. Wood, D.Sc., F.Inst.P. Published by G. Bell & Sons, Ltd. xiv + 519 pp. Price 25s. net.

The various phenomena included in the section of physics known as "Sound" have, in the last few years, acquired great and increasing importance. The telephone, the gramophone, broadcasting and the "talkies" have all demanded a detailed knowledge of the functioning of the various vibrating systems which are interposed between the source of the sound and the ultimate hearer. This demand has necessitated great developments in the theory of the subject and the invention of many new methods and devices by which the theoretical deductions can be submitted to the test of experiment. Sound waves and allied vibrations in air, water and rock are now used for measuring distances over land, the depth of water beneath a vessel at sea, and for ascertaining the depths of geological strata containing oil or minerals.

In view of these developments, an up-to-date book on the subject, such as the volume under review, is welcome. It is divided into five sections. The first deals with the theory of the vibrations of a particle, with electrical vibrations, and with plane and spherical waves. The second section deals with vibrating systems and sources of sound, such as strings, bars, diaphragms, air cavities and the piezo-electric crystals used to control the frequency of modern wireless transmitters, together with the methods used to observe the motion of vibrating bodies.

Section III deals with the transmission of sound in various media. In the fourth section an account is given of the various devices used to receive and transform sound energy, and also of the methods by which sounds can be measured, analysed and recorded.

The last section deals with the technical applications of the subject. This comprises the various systems of echo sounding and sound ranging, the methods by which the acoustics of buildings are investigated, the reproduction of sound by gramophones, loudspeakers, the photophone and phono films, the problem of noise reduction, and sound signalling in air and water. In an appendix a number of useful tables is given.

The book is well printed on good paper, and should find a place in the library of anyone who is at all concerned with the subjects with which it deals.

Mechanical Conveyors for Offices. "*Les Appareils Transporteurs Mécaniques de Bureau*," par J. Jacob, Ingénieur en Chef des Postes et Télégraphes, Paris.

In this book M. Jacob has brought together a large amount of information, with drawings and photographs, in regard to mechanical conveyors used in offices for the rapid conveyance of papers and parcels. In the organisation of the offices of large industrial or commercial businesses the importance of providing rapid and reliable facilities for the conveyance of papers is now well recognised, and this book will appeal to a wide circle of students.

For the purposes of the telegraph, telephone and postal services, considerable ingenuity is being spent upon the construction of transport machinery. The writer of this book, an Engineer-in-Chief in the French Service, is fully conscious of the practical requirements of the various branches of the Post Office, and the problems are discussed with expertness and an intimate knowledge of the difficulties that have to be overcome before large carrier systems can be successfully established.

With open bands the rapid conveyance of a telegram from one point to another in an Instrument Room presents to the

engineer a number of interesting problems. Speeds beyond three feet a second introduce troubles of several kinds: air currents are set up and cause the forms to rise and to flutter to the floor or to out-of-the-way places; and electrified belts cause the paper to adhere to the fabric, and the forms are then carried beyond their drop points, with the possibility of their getting mutilated. Atmospheric changes cause the belts to contract or to slacken, and compensation devices have to be fitted. Noise and vibration and the costs of construction and maintenance have all to be kept within tolerable limits. The author deals with these questions; and chapters are devoted to cord carriers, pick-up carriers, belt conveyors, pneumatic tubes, and postal transporters. Band carriers with selective devices are also described in detail, including the inventions of M. Krieger, which are being installed at large French offices.

The book is published by M. M. Dunod, 92, Rue Bonaparte, Paris (VI).

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at July 31, 1930, was 1,916,058, representing a net increase of 4,231 on the total at the end of the previous month.

The growth for the month of July is summarised below:—

Telephone Stations—	London.	Provinces.
Total at 31st July, 1930	688,330	1,227,728
Net increase for month	1,490	2,741
Residence Rate Subscribers—		
Total	170,963	266,586
Net increase	459	1,024
Call Office Stations (including kiosks)—		
Total	6,269	26,238
Net increase	66	215
Kiosks—		
Total	1,925	6,841
Net increase	42	115
Rural Party Line Stations—		
Total	—	9,755
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,786
Net increase	—	34

The total number of inland trunk calls dealt with in May, 1930 (the latest statistics available), was 10,550,729, representing an increase of 375,447, or 3.7% over May, 1929.

Outgoing international calls numbered 48,354 and incoming international calls 51,027, representing increases of 5,586 (13.1%) and 5,360 (11.7%) respectively over May, 1929.

Further progress was made during the month of August, 1930, with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Cunningham, Livingstone (automatic).

PROVINCES—Auchterless, Boreland, Brading, Doddington, Eden, Etchingam, Gosforth, Hendre, Johnston, Knock, Leconfield, Lumphanan, Moccas, Skipsea, Stapleford, Stenton, Woodbury Salterton (all rural automatics); Potters Bar,

and among the more important exchanges extended were:—

PROVINCES—Alloa, Eastbourne, Fleet, Grantham, Guildford, Newbury, Rushden, Selly Oak, Stechford, Whitefield.

During the month the following additions to the main underground system were completed and brought into use:—

London—Edgware (section of London—St. Albans cable), while 78 new overhead trunk circuits were completed, and 85 additional circuits were provided by means of spare wires in underground cables.

LEEDS DISTRICT NOTES.

LORD BROTHERTON, having seen the Post Office staff at play when the sports were held in the grounds of his residence, as reported in last month's notes, decided to see their work-a-day life, and, escorted by the Postmaster-Surveyor, Lt.-Col. Jayne, D.S.O., O.B.E., M.C., he recently made a tour, accompanied by his nephew, Mr. Charles Ratcliffe, of all branches of the Leeds Head Post Office. He was keenly interested in the telephone exchange—he arrived during the busy hour—and in the developments which are taking place in the Telegraph Instrument Room, and it can truly be said that his visit was one of mutual pleasure.

Promotions.—Our hearty congratulations are extended to Capt. F. A. Linsell, M.C., on his appointment to the post of Executive Engineer at Bradford. Capt. Linsell was formerly Assistant Engineer in the Technical Section of the Superintending Engineer's Office, South Midland District, Reading, and evidently that district is endeavouring to liquidate its indebtedness to the N.E. District for the release of Mr. E. S. Francis, who took up the position of Asst. Superintending Engineer at Reading a few weeks ago.

We also extend a hearty welcome to our new Staff Officer, Mr. J. C. Macdonald, who has come to us from Scotland West District. Although his name conveys his nationality, Mr. Macdonald is no stranger to the north of England, having spent most of his official career at Manchester. We observe, in fact, that he has been stationed in Glasgow for two very brief periods only, and rather suspect that he is one of those Scotsmen who consider that the finest road in Scotland is the road to England.

Heat Wave Happenings.—Leeds enjoyed the distinction, during the first day of the heat wave, of being the hottest place in the British Isles, 141° in the sun and 92° in the shade were recorded. The heat was either very humid or the temperature inertia of the buildings was too much for the rapid rise, with the result that unprecedented condensation occurred everywhere. The walls and ironwork of the Head Post Office wept copiously, and, what was far more serious, was the condensation on the back of the ebonite of the switchboard jacks. This had the effect, in the case of the York dialling-out group of junctions, of providing a leakage path of sufficient magnitude to prevent the transmission of dialling impulses. This particular jack strip suffered more than the others, as it happened to be at the base of the multiple field. The difficulty was eventually surmounted by shifting the junctions in question to upper jack strips.

The technically-minded will be interested to know that, using the 5-volt scale of a P.O. detector and a 4½-volt battery, the leakage between each leg on the jack strip in question was sufficient to cause a deflection of 15.

The battery dialling junctions are the only ones likely to be affected by this trouble, as it is doubtful if the partial short-circuit produced by the condensation would ever reach sufficient magnitude to disable the loop dialling or signalling junctions.

Another marked effect of the humidity was overhearing on the various service junctions from the Supervisor's desks.

We have heard that the policeman's lot is not a happy one, but the following extract from the *Bradford Telegraph and Argus* indicates that the lot of an engineering lineman on emergency fault duty is no bed of roses:—

Telephone Mechanic Meets a "Live Wire."

"A policeman, noticing a man behaving in what he thought was a suspicious manner outside Leeds General Infirmary late last night, seized him as he was bending down in the shadow under a ray coming from a lighted window.

"When the policeman pulled the crouching man to his feet and turned him about in the light, he saw that he had no collar and tie, and that under the old rainproof he was wearing he had an electric torch in one hand and a screw-driver in the other. Peeping from his pocket was a pair of pliers.

It was not until another police officer arrived that the supposed suspicious character established his identity as a telephone mechanic who had been called out from his home to attend to a telephone fault at the infirmary."

Leeds Civil Service Ladies' Swimming Club.—The Club has had a very successful season, and with a membership of over 90, has been able to show a small balance in hand.

Winter Mixed Bathing Club.—An attempt is being made to run a winter club at Cookridge Street Baths, Leeds, on Fridays, and for which a membership of 50 is desired; half of this number has already been obtained.

Leeds Civil Service A.F.C.—A full fixture list has been arranged for the season. We have plenty of talent, and hope this year to "take over" the Half Holiday Cup. The "season" was inaugurated well with a win over West Leeds Tradesmen by 5 goals to 4, on Sept. 10. On the 17th a further success was registered, against Leeds City Tradesmen, by 3 goals to 2.



OPERATORS IN FAR DISTANT LANDS.

THE above groups of telephone operators in far distant countries are not intended to serve any technical or utilitarian purpose; but they are, perhaps, instructive from a sociological point of view. They represent telephonists in countries differing as widely in climate, in culture, in social and in economic conditions as Iceland, Canada, California and Brazil. One would have thought that young women of a purely Norse stock in the comparative isolation of Iceland would present a marked difference in appearance from the mixed Latin colonist and native elements of Brazil, and these, again, from that amalgam of races which is the result of a century of emigration from Europe to North America. And yet what strikes us most about these pictures is the comparative uniformity of type, or at least the apparent uniformity suggested by a more or less standardised costume in the different groups. No hint of native costume or local colour is to be found, for all are clad in a style deriving, however remotely, from Paris or some other European centre of fashion, and spreading literally to the ends of the earth.

To enlarge on this theme is obviously a task more suitable to the social historian than to a journal such as this, but we cannot refrain from remarking on it in passing. The fact that the young ladies are good and efficient operators is all that should concern us, and we are content to assume that they are of good average merit.

If ours were one of those journals which seek to stimulate their circulation by large cash prizes to their readers, we would offer a prize to those who could correctly label the four pictures. As we are not, we will put readers out of suspense by explaining that A represents the Canadians, B the Icelanders, C the Brazilians and D the Californians. The snowy background of B might give some clue to the Iceland group, but is equally suggestive of Canada in winter, whilst the dark hair noticeable in C is by no means confined to Latin types. The groups A and D affect a crinkly style of coiffure, which certainly suggests an American beauty parlour—but then, again, these institutions are not confined to America. We do not wish to raise a controversy, but hazard the opinion that a group resembling any of the four might have been taken from an English Exchange.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of August resulted in a net gain of 2,417 stations.

Kiosks.—The number of kiosks in London continues to increase. At the end of August 1,980 were working, and there were advice notes with the engineers for a further 146.

Since the beginning of this year 399 new kiosks have been provided, an increase of 25% on the number existing at the beginning of the year.

London Telephone Service Sports Association.

The presentation of prizes for the summer events will be made during a social evening that is being held in the Cornwall House Refreshment Club, on Friday, Oct. 17, and it is hoped that Sir Henry Bunbury will be able to be present with us again.

The evening will commence with music from 5.30 p.m. to 6.30 p.m., when the prizes will be presented, followed by a social, at which most of the best-known artistes in the L.T.S. will appear. Admission free, programmes, sixpence each, will be obtainable either before the evening or at the door.

Cricket (Contract Branch).—It was a sorrowful story one heard when the Accounts Branch eleven arrived at Chiswick and related the series of misfortunes that had befallen their "best" players over the week-end.

The match was to decide who should hold the shield, as both teams had finished level in the league.

As if in sympathy with the difficulties of the Accounts Branch, Dickinson beat Drabwell in the toss and generously extended to him the privilege of taking the field in a drizzling rain, with a wet ball, and the prospects of a good soaking for his men. Such acts of charitableness are frequently displayed in cricket.

Fifty-two runs for 3 wickets and many dry men still to bat was good going.

Then somebody suggested that the fielders should retire for a change of clothing, and the groundsman having, apparently, been bribed by the Accounts Branch, ran away with the wickets, after the manner of the nursery rhyme.

Thus ended another injustice to the Contract Branch.

Secretary Hough may not, however, agree with this view of the game. He would, perhaps, say that in cricket there is such a thing as collapse, that the Widdups of the Accounts Branch can wear down any bowling and force a draw if a win is impossible, that his own sprightliness at fine leg is not to be discounted, that Captain Drabwell was unfortunate when he dived and just missed that chance offered by Doody early in the game.

At any rate, both teams agree that had it not been for the Traffic Branch this prolongation of the season into winter would not have been necessary, and Umpire Shepherd must have chuckled with glee as he watched the efforts of his rivals, all dressed up after the fashion of Kipling's "flannelled fools," trying to play cricket whilst he himself seemed to be thoroughly enjoying the conditions in oilskins and sou'wester.

Scores—

Dickinson, c. Widdup, b. Greenway	...	14
Doody, b. Smith	...	11
Barnsley, b. Greenway	...	10
Hodgkiss, not out	...	9
Fitzgerald, not out	...	3
Extras	...	5

52 for 3 wickets.

L.T.S. Football.—It is many years since the L.T.S. football team entered upon a season with such promise as this one seems to offer. The winning of the 2nd Division Civil Service League last year automatically resulted in promotion to the 1st Division.

Many additional players have been recruited, and the playing strength is between 35 and 40 players. In order to cater for this long list of men a second team has been formed and a good list of friendly games has been arranged.

Two successful practice games have been held at Chiswick, and a good team, able to hold its own in higher circles, should be available.

The fixtures for September and October are given below :—

League Eleven.			Second Eleven.		
Sept. 20	...	—	Swift Sports Assn.	...	—
" 27	...	Customs. Home.	Exiles.	...	—
Oct. 4	...	War Office. Away.	—	...	—
" 11	...	—	Hicomind.	...	—
" 18	...	Met. Water Board. Home.	Western Union Tel. Co.	...	—
" 25	...	Middx. County Junior Cup.	—	...	—
" 25	...	Board of Education. Home.	Trojan Motors.	...	—

London Telephonists' Society.

Just a reminder that the first meeting of the Society's 1930-1931 Session takes place at the Y.M.C.A., 186, Aldersgate Street, E.C.1, on Friday, Oct. 3, at 1.30 p.m.

The President of the Society, Mr. F. B. Nichols, will deliver his introductory address, the subject being "Why are we here?" Come and take part in the discussion.

Please also reserve Nov. 7 for the second meeting at the Institute of Electrical Engineers. Dr. Turney, of the A.T.M. Co., Ltd., is making a special journey from Liverpool to take the Society on an illustrated trip through the Strowger workshops.

Stamford Dramatic Society.

The Society will present, on Monday and Tuesday, Nov. 17 and 18, at the Cripplegate Institute, Golden Lane, E.C.1, "The Lilies of the Field," a comedy in three acts, by John Hastings Turner.

Tickets, at usual prices, may be obtained in advance from the Business Manager, Miss Dorothy Coleman, The Telephone School—Telephone number, Clerkenwell 0101, Extension 3.

Post Office Ambulance Centre: Annual Competitions.

The finals of the Annual First Aid Competitions for the London Postal Ambulance Challenge Shield (Holders, L.T.S.) and the Women's Trophy (Holders, L.T.S. Exchanges) will be held on Nov. 19, 1930, at 7.30, at King George Hall, Caroline Street, Great Russell Street, W.C.1.

Admission by programme—threepence. A limited number of seats reserved at one shilling. It is hoped all readers will endeavour to be present and support the Centre.

Miss E. K. M. Meeser, Controller's Office, L.T.S., Cornwall House, Waterloo Road, S.E.1 ;

Mr. J. E. G. Rogers, I.S., Mount Pleasant, E.C.1 ;

Joint Competition Secretaries.

Classes and Lectures for the coming Winter Session.

L.T.S. Controller's Office	Home Nursing	Starting Thursday, Oct. 9, 1930.	4.30-6.30 p.m.	Lecturer : Dr. Barnes.
G.P.O. South	...	First Aid	...	Starting Oct. 7, 1930. 6-8 p.m. Lecturer : Dr. Barnes.
Holborn	...	Home Nursing	...	Starting Oct. 13, 1930. 6-8 p.m. Lecturer : Dr. Wright.
Battersea	...	First Aid	...	On Wednesdays in October. Starting date not yet fixed. Lecturer : Dr. Wright.
Clerkenwell	...	Home Nursing	...	Starting date not yet fixed.

Please join our classes and so obtain expert knowledge to deal with all accidents.

E. K. M. MEESER,
General Secretary, Women's Section, P.O.A.C.

Obituary.

We regret to record the passing away of Mr. F. G. Walden, who, as a senior Night Supervisor, was attached to the Training Section. Mr. Walden was performing his normal duties up to within 4 days of his death, which occurred with distressing suddenness on Sept. 3, as a result of pneumonia.

The interment took place on Sept. 6, at Addington, and was preceded by a special service at Christ's Church, West Croydon, in connexion with which Mr. Walden was a well-known member of the Toc H. group.

The service was attended by many of his colleagues—Mr. Pettigrew, from the Training Section, represented the Controller's Office.

Mr. Walden, who entered the service of the National Telephone Company 30 years ago, was 56, and had last year been promoted to an "Allowance" Supervising position. His conscientious and thorough character recommended him to all: his personality will be much missed. Sympathy is extended to the bereaved family.

Personalia.

Resignations on Account of Marriage.

Assistant Supervisors, Class II.

Miss F. J. Keel, of Monument.

Telephonists.

Miss T. M. Allport, of Abercorn.	Miss H. Oakley, of Paddington.
" G. M. Revell, of Albert Dock.	" V. Sherlock, of Paddington.
" J. A. Bentley, of Buckhurst.	" F. C. Bedwell, of Park.
" M. S. E. Cuming, of Central.	" A. M. Lawrence, of Park.

Miss D. E. C. Cooke, of Central.	Miss C. K. A. Sansom, of Park.
" C. A. M. Bynoe, of City.	" I. D. Barr, of Pinner.
" E. B. Platten, of City.	" F. E. Spencer, of Primrose.
" G. M. Church, of Croydon.	" B. M. Flint, of Reliance.
" E. A. Smith, of Croydon.	" K. Cunliffe, of Regent.
" W. A. Blackburn, of Ealing.	" F. Dyne, of Regent.
" A. V. Cochrane, of Emberbrook.	" W. Wiggs, of Richmond.
" E. S. Slater, of Greenwich.	" A. K. Hunter, of Rainham.
" L. A. H. Watling, of Greenwich.	" G. M. Brown, of Riverside.
" R. A. McKenzie, of Hop.	" E. E. Purves, of Riverside.
" H. M. Williams, of Hop.	" G. E. Coward, of Streatham.
" H. L. Mitchell, of Langham.	" F. E. Greenaway, of Tandem.
" W. A. Lane, of London Wall.	" E. V. Kirby, of Tandem.
" E. M. Mersh, of London Wall.	" F. B. Milstead, of Tandem.
" J. K. Westbrook, of London Wall.	" M. E. Westwood, of Tandem.
" G. K. Chambers, of Maryland.	" N. E. Hickie, of Toll "A."
" E. P. Dalton, of Maryland.	" K. M. Sutton, of Toll "A."
" E. M. Prior, of Maryland.	" F. Mellor, of Tottenham.
" V. M. Archer, of Museum.	" F. A. Difley, of Trunk.
" D. A. Wicks, of Museum.	" C. L. Leeming, of Trunk.
" E. A. Jarvis, of Metropolitan.	" D. M. Pope, of Trunk.
" W. G. Allard, of New Cross.	" O. W. Newport, of Terminus.
" E. M. L. Bunce, of New Cross.	" C. D. Crook, of Victoria.
" J. F. Newvell, of North.	" M. E. C. Wittering, of Victoria.
" E. G. Roberts, of North.	" O. E. Woodcock, of Victoria.
" G. Bale, of Paddington.	

BIRMINGHAM TELEPHONE NOTES.

WE are pleased to note the following promotions: Miss B. M. Frost from Asst. Supervisor, Class I, to Supervisor, Trunk Exchange, a position rendered vacant by the retirement of Miss L. B. Chivers; Miss N. W. Blood from Asst. Supervisor, Class II to Asst. Supervisor, Class I; Miss E. M. E. Akers from Telephonist to Asst. Supervisor, Class II; Mr. J. W. Tilley from



Miss B. M. Frost.

Asst. Traffic Superintendent to Traffic Superintendent, Class II, Birmingham; Mr. W. H. Oliver from Clerical Officer to Higher Clerical Officer, Brighton; and Mr. C. R. Smith, Asst. Traffic Superintendent, to the Secretary's Office, Telegraph and Telephone Section.

Sport: Birmingham Civil Service in Cricket Shield Final.—At the third time of asking the Birmingham Civil Service XI defeated the Inland Revenue (London), on the Mitchells & Butlers' ground at Cape Hill, Birmingham, on Sept. 4, 1930, and so qualified to meet the Customs and Excise (London) in the final at Chiswick. London batted first, and although the first five wickets put on 137 they were all out for 186, Matthews (Postal) being the most successful bowler with five wickets for 48. Tyler (Customs) and Sheppard (Engineers) put on 78 for the first wicket for Birmingham, but, despite some steady batting, they had to fight hard for the runs, and eventually won with only two wickets to spare.



Atlas.

You are probably familiar with some quaint, old-fashioned town where the cobbled streets go up hill and down, and you may possibly know Marrycomeup. It is a matter of opinion as to whether its one and only street goes up or comes down, and the opinion depends not so much upon your view of hills as upon your attitude towards life. Some people habitually say "going up" and "coming down" hill instead of "coming up" and "going down," thus admitting that their normal place in life is at the bottom. Ebenezer Oodlebuss—Ben, for short, amongst his friends—is like that. Ben vowed that if ever there was an "up" then the main and only street of Marrycomeup was one. His decision was based upon observations made when he learned that he was at the foot of the hill and his lunch was at the top. If Ben has a fault—and he has hundreds—it is that he is peevish before feeding. After enveloping cider and bread, butter and cheese, he mellowed, and from the bench outside the "Crab and Apple" he felt bound to admit that the street did go down hill. He was even sufficiently mellow to bear with me patiently whilst I enlarged upon the subject of hills in the abstract. I told him that he took a wrong view of life because he always thought of hills as starting at the bottom and going up in toil and pain instead of at the top, from which one might descend in ease and pleasure. "The man," I said, "who walks up hill, either from habit or circumstance, looks down and sees no more than cobbles and his own feet, whereas he who goes down hill looks around and sees the world and other men's faces." He grunted, and then, rising suddenly, said "Come out of your world of theory and pseudo profundity and let me show you a little materialism. Let me demonstrate to you the existence of a fact—simple, but of the utmost importance to the Marrycomeups of this world." We wandered down the quaint old street over the cobbles, past its weather-beaten cottages on to the quay of the tiny harbour, and we paused awhile amidst lobster pots, cordage, nets, capstans, red anchors, odd links of chain, spars, oars and upside boats. There was the smell of the sea, of tar, of fish, there was the lap of the water mingling with the slow rumble of voices, the rattle of shingle, the harsh note of the gulls. Outside and to the left we could see the white foam round the jagged rocks at the base of the head. Ben turned to me and said, "These are facts, but there is another I want to show you." He pointed to an inn which bore the name of the "Sounding Smack." Outside three old salts were leaning against its black tarred wall. "What," said Ben, "do you see?" I confessed that I could see nothing out of the ordinary. "Your trouble, my man," he said, "is that you look too much beneath for the explanation of problems when all the time the answer is on the surface and all too obvious. He then proceeded to explain that the "Sounding Smack" was the foundation of Marrycomeup, and that the cottages in the village were built up the hill behind it. So much, he said, was plain, practical common sense. "Then," he went on, "there remain the three old salts leaning up against the wall of the inn. You would dub them loungers, and if I offered the slightest encouragement you would dribble psychological vapourings as to the reason for their idle habits. But let me tell you, Sir"—waxing warm—"that these men are Atlases. If they moved from their post of duty, the whole village, inn and all, would slide down into the harbour." "But," said I, "do they never go home?" "My poor fellow," he replied, "have you ever seen such a wall in such a place which was not supported by salts?" I don't think I have. There must be sound truth in Ben's explanation, because I noticed that after we had enticed the Atlases into the "Sounding Smack," they promptly took up a similar position against the inside wall.

PERCY FLAGE.

Thoughts.

It is a fine day (Summer has come at last) and to celebrate it all the office windows are wide open. We are high up in the building and feel so far removed from the medley of noises that reaches us from the streets that we seem to be in a little world of our own. The noises float up to us from below—some of them afloat—others come up with a bang and scatter our wits for

a few seconds—and thrust themselves through our concentration on work and divert our thoughts to other things. The sounds tell us the time of day, in some cases the day of the week, and they remind us of weather conditions. The first noticeable noise of the day is the clatter of milk bottles, growing louder as distance lessens between the milk boy and the dining-cum-cloak room nearby. We know now that one hour of our eight has gone by, and it reminds us of joys yet to come. Motor hoots and brake squeaks are so frequent as to pass almost unnoticed, for there is a large garage below, but an occasional loud “pop” has disastrous effects on our nerves for a few seconds, not to mention the unexpected exercise our muscles receive when we nearly leap a foot off our stools with shock. Many times a day a shrill whistle advertises to the world that some fortunate being can afford to travel by taxi, and the tinkle of the car bells reminds us of our own humbler mode of travel.

As we are near the river, we are familiar with the hoots and sirens of the ferry boats and large liners. We take particular interest in the Friday “hoots,” for it is on that day that the liners sail to Canada. “There she goes,” someone says, “the *Doric* off to Canada. I wouldn’t mind being on her.” We like to surmise as to where the ships are likely to be sailing when we hear their sirens blow. Some of them are off to sunny climes, leaving us to envy their passengers bound for the sunshine so sparingly given to England. On foggy days the frequent shriek of the ferry boats’ sirens proves the existence of heavy fog on the river, making “ferrying” a ticklish job. Through it all runs the continuous murmur of the streets—hurrying footsteps, urchins calling out to one another, an old woman singing a song in a quavering voice, errand boys whistling on top note snatches from the Stein Song or the other extreme in tunes—the Blue Danube Waltz—and on special occasions the wireless shop in the street below broadcasts speeches or commentaries on races, &c. The office staff contributes its quota to the noise—telephone bells ring insistently, a clerk and a subscriber argue at the counter, and another clerk is declaiming to his next door neighbour “the proper way the job should be done”; and no day would be complete without the plaint of someone demanding to know who has “pinched” his new pencil or blotting paper or whatever it may be. The voice of the newsboy calling out Yacow, last City Yacow—(Yacow = Echo)—comes as a welcome sound to our ears, for now we know that the afternoon is ending and very soon our footsteps will mingle their sounds in the streets with hundreds of others on their homeward way.

A Contract Officer, seeing a building in course of erection, with an eye to business approached the foreman, and asked who was to occupy the place. The foreman asked “What do you want to know for?” The C.O. said “I am from the P.O. Telephones and I would like to know so that I can fix up an agreement with them if they want a telephone in.” Answer from foreman, “Oh yes, they’ll want a telephone in, alright. This is to be the new . . . Exchange!” E. A.

Our Portrait Gallery.



No. 8.—MISS EDITH NURSE.

The ever growing expansion of the Telephone Service in London has had the effect of causing frequent changes of position amongst those members of the staff who have grown up with it.

Few supervisors have had so many changes or so varied an experience as Miss Nurse. Commencing in 1893 as a telephonist with the National Telephone Company she transferred her services to the new Post Office Telephone Department in 1901, where her ability was quickly recognised and she was promoted to Assistant Supervisor.

Subsequently she was appointed to take charge of the following exchanges: Victoria, 1902-6; City, 1906-1914; London Wall, 1914-16; Avenue, 1916-1918; Victoria, 1918-1921; Trunks, 1921 to present date.

In addition to filling the exacting position of Chief Supervisor of the largest and most important Trunk Exchange in the country, Miss Nurse devotes a large amount of her leisure to the various activities of the exchange staff.

Of a naturally cheerful and happy disposition, she is a welcome guest at any of the Service social functions, and she is indefatigable in her efforts on behalf of the many charities identified with the staff.

A Rhyme for Remorseful Readers.

What have I done for you, Column, my Column?
What is there I ought to do, Column, my own?
Have I striven, do I strive,
And by prose or verse contrive
To keep wit in you alive,
That to others you may be known, Column,
That to others you may be known?
How shall I make amends, Column, my Column?
How ought I to make amends, Column, my own?
Shall I tell the Editress
How I feel for her distress,
Past indifference confess
With a sigh, with a tear, with a groan, Column;
With a sigh, with a tear, with a groan?
What shall I write for you, Column, my Column?
What is there I ought to write, Column, my own?
How to choose from such a range
News of this and that Exchange,
Items sad, or gay, or strange,
That would speedily make you known, Column;
That would speedily make you known.
What shall I vow to you, Column, my Column?
What is there I would not vow, Column, my own?
That each future month shall see
Manuscripts sent in by me—
This my solemn vow to thee;—
And forgiveness I may be shown, Column,
Full forgiveness I may be shown.

Contributions to this column should be addressed: The Editress, “Talk of Many Things,” *Telegraph and Telephone Journal*, Secretary’s Office, G.P.O. (North), London, E.C.1.

LIVERPOOL NOTES.

Telephone Enquiries.—Recently a subscriber rang up the Enquiry and asked for the postal address of a certain party. He was much surprised to find the information was not forthcoming from the enquiry operator and thereupon called up the District Manager. He seemed to be astonished to learn that such information was not available in the Exchange and asked if the operator was not there for the purpose of giving any information wanted. The caller was told where he could probably get to know what he wanted, so that eventually, through the channel of the Telephone Enquiry, he was guided to the right destination.

Another instance of the faith of the public in this general “Enquire Within” department of the Telephones was an enquiry for a doctor in a distant Welsh district. The name of the doctor and the town were given, but the telephone number could not be traced. It transpired in further conversation with the enquirer that “the doctor doesn’t live at . . . , he is only staying there on holiday.”

An instance of an even more peculiar and somewhat startling enquiry occurred when a subscriber rang up and asked the supervisor if she knew where he “could get a coffin made.” With ready tact he was given the telephone number of a local undertaker.

With the end of the holiday season approaching, it is hoped soon to resume meetings with the operating staffs. These more or less informal meetings are welcomed by both parties, and it is hoped to obtain still further benefit from this year’s series. Liverpool was one of the first, if not the first, districts to inaugurate meetings of this character, and they have been productive of mutual confidence between the Traffic and the Operating Staffs. A feature which will be introduced this coming session is a series of “thumb nail” discourses, suggested and prepared by the District Manager. A short discourse of 3 or 4 minutes on some well-known salient of operating practice is a good way to open the meetings, and the exhibition of charts showing service observation results always arouses interest.

Mr. David, whose promotion was referred to last month, was, on his departure from Liverpool, the recipient of several handsome presents from the Clerical, Observation, and Supervising staffs, which were presented to him on their behalf by the District Manager at an informal gathering. His colleagues in the Traffic Office are making him a special presentation at a function to be arranged in his honour shortly. They felt that Mr. David’s long association with them and the regard they had for his personal qualities should be marked in some special way.

MANCHESTER NOTES.

Transfers.

MISS M. C. SMITH, Writing Assistant, Traffic Section, has been transferred to the Ministry of Labour, Bury. On her departure she was the recipient of a week-end case, handbag and fountain pen from the staff of the District Manager's Office, as a token of goodwill. Our best wishes go with her in her new position.

We offer a very cordial welcome to Mr. J. M. Crombie, Traffic Superintendent, Class I, on his arrival from Bristol to take up the position vacated by Mr. J. L. Parry, who was recently promoted District Manager, Birmingham. Mr. Crombie can be assured of every possible assistance being given him in the big problems of Manchester Telephone Service, not only by the Traffic Section, but also by the other sections of the District Manager's Office.

Resignation.

Rusholme Exchange.—Good wishes to Miss Rosa Cookson, Assistant Supervisor, Class II, who resigned the service on Aug. 19, to be married. "Rosa," as she was affectionately called, was the recipient of a number of useful presents from old colleagues at many of the Manchester sub-exchanges, in addition to a handsome tea service presented by the Rusholme staff.

Miss Cookson will shortly leave these shores for residence in Philadelphia.

Obituary.

It is with profound regret we have to announce the death, at the comparatively early age of 50, of Mr. Stanley J. Hamilton, H.C.O.

Mr. Hamilton was a well-known figure in Manchester telephone circles and also to those of the National Telephone Co. and Post Office who have sojourned here for varying periods of service.

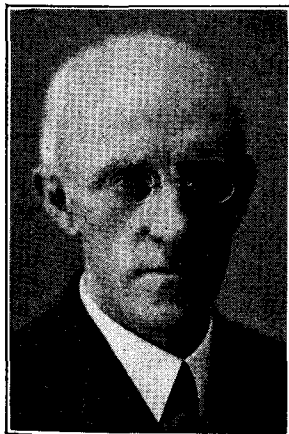
He had not enjoyed the best of health for some time, and this culminated in an illness of about a month's duration, following which his death occurred in the Manchester Royal Infirmary on July 24. He leaves one daughter, who is now doubly bereaved, Mrs. Hamilton having passed away about four years ago, and to her we extend our heartfelt sympathy.

Mr. Hamilton was laid to rest at Woodford Parish Church on July 26. Floral tributes were sent by Mr. J. T. Whitelaw, District Manager, the Staff Officer and Higher Clerical Officers, the Rental Section of the District Manager's Office, of which he was in charge, the Contract Section, together with a wreath from the rest of the District Manager's Office Staff.

Mr. Godfrey, Staff Officer, Mr. Sadler, H.C.O., and Miss Thornhill represented the District Manager's Office at the funeral.

GLASGOW TELEPHONE NOTES.

AN interesting gathering was held on the evening of Sept. 4 in the District Manager's Office under the chairmanship of Mr. J. Law, Staff Officer. Mr. W. R. Kelly, who had for the past six years held the post of Higher Clerical Officer in the Glasgow Office, was leaving to take up an appointment as Chief Clerk at Gloucester. Mr. A. E. Coombs, the District Manager, congratulated Mr. Kelly on his promotion, and expressed the regret that every member felt on the separation. Mr. Coombs also referred to the good qualities of Mr. Kelly and expressed the hope that the present promotion was but a step to further advancement. The staff were anxious to show their appreciation of Mr. Kelly, and on their behalf, Mr. Coombs asked him to accept a small token of their esteem in the form of a wireless set. Mr. Law, Mr. Murray (Clerical Officer), Mr. Morton (Higher Clerical Officer), and Mr. F. Lucas (Contract Manager) also spoke. Mr. Kelly's reply was quite out of the ordinary. Before acknowledging the gift, and the previous speakers' expressions of good will, which he did in felicitous terms, he gave a delightfully humorous description of his relations with the various sections of the District Manager's Office during his six years' sojourn in Glasgow. In the course of his remarks the characteristics and idiosyncrasies of chiefs and other officers, were the subject of Mr. Kelly's quaint Manx humour, and the points of his various references caused much amusement. The Glasgow staff will not readily forget "Kelly from the Isle of Man." Their pleasure in his promotion is tempered with the regret that it involves the removal of an interesting and likeable personality from their midst.



MR. W. R. KELLY.

We congratulate Miss H. S. Fenton, Writing Assistant, on her promotion to the Clerical Officer grade.

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Cords, down to the finest sizes, in
Galvanized Steel, Phosphor Bronze, &c.

A Day with Pepps.—Wednesday: Wednesday is an excellent day for husbands to humour their wives. Up betimes, about 4 o'clock, waked by a noise between a pig and a cow and a dog, nobody after we were up being able to tell us what it was. After reading a little in "Osborne's Advice to his Son," which I shall not ever admire enough for sense and language, I made me ready for my office. On my way called at Hercules Pillars, all alone, and there did spend 6d. only on myself. Mighty busy at the office all the morning, and stated my accounts very clear and fair. Home to dinner and found it so well done, above what I did expect from my mayde, Susan, that I did call her in and give her sixpence. Comes Mr. Phillips and dines with us, and a pretty odd-humoured man he seems to be, not hospitable himself, but an admirer of the virtue in others; but good withal, and of mighty great method in his eating and drinking. I never saw a man eat with so much earnestness and application, not hastily, like a grammarian, or one of the vulgar, but slow and appreciative like an anaconda or a real epicure. Back to the office all the afternoon and to my monthly accounts, and thankful I am to find I have increased my last balance, though but a little, but I hope ere long to get more. In the meantime offer my praises for what I have, which is £1,209. So with my heart glad to see my accounts fall so right in this time of mixing of monies and confusion, I home. After that to a bookseller's and bought for the love of the binding three books. Thence to . . . where I did watch the gaming, and strange the folly of men to lay and lose so much money, and very glad I was to see the manner of a gamster's life, which I see is very miserable, and poor and unmanly. After that did meet with Mrs. Clarke, and was very much taken with her—a comely proper woman, and a woman of the best language I ever heard. Thence to the "King's" where much company. I, by having but 3d. in my pocket, made shift to spend no more, whereas if I had had more I had spent more as the rest did, so that I see it is an advantage to a man to carry little in his pocket. And then home again, and there to sing and to pipe with my wife, and that being done, she fell all of a sudden to discourse about her clothes and my humours in not suffering her to wear them as she pleases, and grew to high words between us, but I fell to read a book (Boyle's Hydrostatics, which is a most excellent book as ever I read, and I will take much pains to understand him through if I can, the doctrine being very useful) aloud in my chamber and let her talk, till she was tired and vexed that I would not hear her, and so become friends. My wife did then read to me in Sir R. Cotton's book of warr, which is excellent reading and particularly I was mightily pleased this night in what we read about the little profit or honour this kingdom ever gained by the greatest of its conquests abroad. After supper fell to talk of spirits and apparitions, whereupon many pretty particular stories were told. So to bed, but almost afeared to lie alone after the discourse upon spirits, but for shame I could not help it, otherwise my mind eased of a great deal of figures and castings, which I this day did perfectly.

BRISTOL DISTRICT NOTES.

Telephones.—To mark the occasion of the recent marriage of Mr. C. W. Davies, Exchange Superintendent, Bristol Local Exchange, a pleasing little ceremony took place in the District Manager's Office on July 16, when Mr. Davies was presented with a very fine dinner service, contributed to by members of the District Office, Contract and Traffic Staffs. As an indication of the good qualities and popularity of Mr. Davies, the Bristol Local Exchange Staff presented him with an oak chiming clock and the Bath Exchange Staff with a silver cakestand.

Presentation to Mr. J. M. Crombie, Traffic Superintendent.—On Aug. 22 a gathering of some 50 members of the Post Office staff in the Bristol District assembled in the District Manager's Office to say "au revoir" to Mr. J. M. Crombie, Traffic Superintendent of the Bristol District, on his transfer to the post of Traffic Superintendent of Manchester. The chair was taken by the District Manager, Mr. A. G. Bristow, and the presentation, which was made by the Postmaster-Surveyor, Mr. W. Blandford Harris, comprised a canteen of cutlery, a silver pencil, and a dress ring for Mrs. Crombie. These presents were made on behalf of the Postal, Telegraph, District Office, Operating and Engineering Staffs in the district. A brown leather wallet, subscribed for by the Telephonists at the sub-exchanges, was presented by Miss E. E. Turner, Travelling Supervisor. It was evident from every side that Mr. Crombie was highly respected by all who had dealings with him. His period in Bristol covered some 14 years, and he had done much valuable work in organising the district both during and after the war, when telephone development began to make rapid progress and the traffic problems associated with that development required considerable care and foresight. Eloquent appreciation of Mr. Crombie's straightforward and capable methods of dealing with matters that came before him, especially staff problems, was a note frequently struck by the speakers.

A pleasant feature of the ceremony was a speech by Mr. A. L. C. Eyers, news editor of the *Bristol Evening Times and Echo*. Mr. Eyers, speaking on behalf of the Bristol Press generally, said that the relations existing between the Bristol Telephone Department and the Press had always been cordial, and that the co-operation given by Mr. Crombie had been of very great assistance in creating and maintaining those relations. The use made of the telephone by the Press had been extensive and representatives attached great importance to the need for easy and rapid connexion. He wished to express his appreciation of the assistance Mr. Crombie had afforded him at all times, especially for special events such as the last General Election.

Civil Service Swimming Club.—On Monday evening, Aug. 18, the Annual Gala of the Civil Service Swimming Club, open to all members of Civil Service departments in Bristol, was held at Kingsdown Baths. The Ladies' Section was of particular interest to the Telephone Department, for the candidates from the Bristol (Local) Exchange succeeded in carrying off a very fair proportion of the trophies.

Miss E. E. Osborne, telephonist, was first in the 50 yds. championship race, and in addition to winning the first prize for the race, won the Silver Championship Cup presented by Mr. Pugh, late Postmaster-Surveyor of Bristol. This is the second year in succession that Miss Osborne has won the Cup.

Miss A. M. Fisher, telephonist, was third in both the 50 yds. championship and the 25 yds. handicap events.

Miss E. M. Hewlett, telephonist, won the Novice Single Width event.

The standard of performance in the gala was very creditable, and we congratulate Miss Osborne and her colleagues on their successes.

Resignations.—The marriage market continues to remain steady, with a tendency to rise. Recent resignations on account of marriage are:—

Miss W. I. Baxter, shorthand-typist, District Office.	
" L. E. Brooks, telephonist, Bristol (Trunk) Exchange.	
" C. A. Buckland, " " (Local) "	
" E. D. Exon, " " (Trunk) "	
" L. M. Gough, " " " "	
" E. G. Grant, " " " "	
" N. M. Lewis, " " " "	
" F. A. Osgood, " " " "	

These ladies take with them our good wishes of health and happiness for the future.

The Telephone Service and the Press.—We report above a brief résumé of a speech, made by Mr. A. L. C. Eyers, of the *Bristol Evening Times and Echo*, in which he refers to the cordial relations that have always existed between the Telephone Department and the Press, and the co-operation that has been afforded him in telephone matters. Although much of the Press work is dealt with by means of private wires, there is still a large volume of traffic to and from newspaper offices passing through the exchange system.

The position in Bristol has been somewhat abnormal during the past 12 months. In October of last year competition between rival local newspaper firms became very acute and, as is usual when large concerns work in opposition, each firm took every possible step to make its papers as attractive as possible. We realise that much of the effort in this direction does not concern the telephone administration, but nevertheless, it is appreciated that, so far as the collection of news is concerned, the telephone is probably the most important single factor in the business, and that a hitch in an urgent call can make all the difference between success and failure of a report.

When the competition began to assume large proportions each newspaper firm applied for ever increasing telephone facilities until they became, and still remain, the largest subscribers in the district. Apart from ordinary telephone traffic, they required additional arrangements to be made to enable them to report fully on special events with a minimum of time, and as the circulation of the papers covers a large area outside Bristol, the events occurred with some frequency. Indeed, so frequent did they become that one firm found it necessary to arrange for calls from various centres—some of them 40 miles away—to be concentrated simultaneously to one telephone. The arrangement was one which could not be made with the standard private exchange equipment, and suitable apparatus had to be installed. Coupled with this was a need for exercising care to see that these simultaneous calls matured with as little delay as possible.

It will be appreciated that the Traffic, Contract, Operating and Engineering staffs concerned were called on to make special efforts to see that the facilities were quickly available and that they operated efficiently when fully used. Such efforts tend to lose some of their value with the general public, and it is indeed refreshing to hear appreciation expressed by one whose business it is to make frequent use of them.

GLOUCESTER NOTES.

Staff Outing and Presentation to Mr. W. H. Cope.—The Gloucester District Manager's Staff outing to Stratford-on-Avon and Birmingham was unanimously voted a most enjoyable affair. The party journeyed by char-a-banc to Stratford, and after spending a couple of hours in boating, swimming and sightseeing, we all gathered for tea at the Shakespeare Galleries Tea Rooms. Here we were met by Mr. and Mrs. Cope, who had travelled from Birmingham to join us. Shortly prior to the outing Mr. Cope had been promoted from the Chief Clerkship at Gloucester to a similar post with Staff Officer grading at Birmingham, and, after tea, he was presented with a case of fish knives and forks and a dinner service, as a token of regard from the Gloucester staff.

Mr. A. Barker, Traffic Superintendent, made the presentation, and paid tribute to the remarkable manner in which, by his quiet efficiency and just dealings, Mr. Cope had won the confidence and esteem of the staff at Gloucester. Felicitous and congratulatory speeches were also made by Mr. Brodie, Contract Manager, Mr. Miles, Higher Clerical Officer, and Mr. Jack.

Mr. Cope, in a very happy speech, returned thanks for the expressions of goodwill and for the presents. His appreciation of the kindly feelings of the staff towards him was, he said, enhanced by the fact that he had spent only a few months in the Gloucester office. Both Mrs. Cope and he were truly sorry to leave Gloucester, for they were agreed that they had spent there one of the happiest times of their lives. He desired to take that opportunity of tendering his thanks to all members of the staff for their loyalty to him, and he should, he continued, always retain the happiest memories of them all.

We were all pleased that Mrs. Cope was able to be present on this occasion, and especially so when, after a little persuasion, she was prevailed upon to address the company.

The journey was then continued to Birmingham, where we were accompanied to the Grand Theatre by some members of the local staff.

Only the lateness of the hour persuaded us to bid farewell to our old and new friends, but, although daylight had faded, the return journey was enlivened by song and laughter. Gloucester was reached at about midnight, and ere we parted we agreed that the outing had been a great success.

Obituary.—It is with deep regret that we record the death of Miss E. M. Mathews, Female Clerical Officer with allowance, Gloucester District Manager's Office. Miss Mathews, who was 33 years of age, died on Aug. 15, after an illness which confined her to bed for only a few weeks, and was interred at the Hempstead (Gloucester) Churchyard on Aug. 18. Mr. John H. Storrie, District Manager, attended the funeral, and the staff were represented by Misses King and Ravenhill and Messrs. Jack and Hayward. Many beautiful floral tributes were sent, amongst them being that from the District Manager and Staff.

Amongst the female members of the local staff Miss Mathews held one of the longest records of service, having entered as a Girl Probationer in January, 1922. Two years later she joined the staff of the District Manager's Office as a Female Clerical Assistant, eventually taking charge of the Fees Section in November, 1928. She was a zealous and conscientious officer, and will be greatly missed by her colleagues.

Miss Mathews was a member of a family of Post Office servants, and our deep sympathy is extended to them in this very sad bereavement.

THE Telegraph and Telephone Journal.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXX.

MR. G. S. STOW.

MR. G. S. STOW, Senior Staff Officer in the Secretary's Office, has completed more than 40 years' service, having been in the Mails and Buildings Branches before joining the Telephone side. His most outstanding attributes are tact, discretion, courtesy, consideration and insight into the minds and difficulties of others; qualities which have made him exceptionally popular with his fellows of all grades. His epistolary style is high and his polished manners and courtly bearing suggest perhaps the diplomatic rather than the commercial side of the Civil Service. His gift of sympathy has ensured that every complainant having a real or imagined grievance felt that his standpoint was understood and that endeavour was being made to give him not merely his due but even special consideration so far as that is possible,



having regard to the obligation resting on all public servants not to show favour between individuals; and Mr. Stow's success has been as great in personal interview as in written communication. It is not too much to say that the exercise of his gifts has achieved excellent results in sweetening the relations between the public and the Department.

An exceptionally large gathering of colleagues and friends from many departments of the Post Office, and some outside, assembled to give him a send-off and to present him with an all-mains wireless set and a handsome cigarette case. His expression of thanks to the gathering showed that his repertoire includes the power of making speeches succinct and to the point. He has taken up residence near Farnham, in a delightful part of a glorious countryside. That he may live long to enjoy in full health the occupations of his leisure time is the hope of his innumerable friends, for whom his retirement creates a marked gap.

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - -	{	Lieut.-Col. A. A. JAYNE.
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		W. D. SHARP.
		W. H. U. NAPIER.
Managing Editor - -		W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

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FURTHERING HOME INDUSTRIES.

WHAT is there in the Derbyshire air that might be supposed to make Derbyshire political meetings peculiarly suitable in the opinion of lecturers for ill-informed attacks on the telegraph and telephone? Several years ago we related the case of a lady who was sent down by her central office to address a Derbyshire political gathering, and whose facts and figures with regard to the Post Office were so inaccurate as to be grotesque. As we then pointed out, few of her hearers were in a position, even if they had the inclination, to correct her fantastic statements. The game of gammon is a perfectly safe and easy one. It is like kicking goals where there is no goalkeeper, or stepping out of one's crease where there is no wicketkeeper. We can only hope it amuses and satisfies those who play it.

Now we find a Mr. Herbert Wragg reported as stating at a recent meeting, also in Derbyshire, that Post Office telephones are the worst to be found in most of the civilised countries of the world. This, of course, is a purely unsupported statement and at best must be a matter of opinion. When he goes on to say, however, that there are less telephones per head of the population of this country than in any other civilised country he is quite demonstrably inaccurate. France, Belgium, Holland, and Italy, to name only a few countries with a lower telephone development per head than this country, are, it will scarcely be questioned even by a political controversialist, civilised countries. Then again, he describes our telephones as the dearest of any—another inaccurate and ill-considered statement. Telephone rates in different

countries, with their differing values of services given, different scope, and different additional charges, are not easily comparable, but this fact seldom troubles the controversialist. On the contrary, it comforts him, because if he tells an audience authoritatively that A's apples are better and cheaper than B's pears, his words may carry conviction, and his hearers cannot contradict him if they have no knowledge as to the respective qualities and quantities of the apples and pears in question.

We observe that Mr. Wragg was addressing a Home and Empire campaign. How disparagement of home telephones can further such a campaign is not easily discernible. Rather must it, we should think, have the opposite effect. Perpetual unfair attacks on the Post Office system do a grave disservice both to capital and labour in their inevitable effect of slowing down schemes of telephone development at a time when larger orders for telephone plant would be as welcome to manufacturers as the resultant additional labour required would be to workers. Constant denigration can scarcely serve home and empire, while it cannot fail to slow down the wheels of industry and employment. We think that Derbyshire political audiences have a grievance against their central offices. They are at least entitled to expect better informed lecturers to instruct them.

HIC ET UBIQUE.

THE prize of three guineas which we offered in our issue for a new design for the cover of this *Journal* has been won by Mr. W. A. Morris of the Engineer-in-Chief's Department. The new design appears on the cover of this issue.

We have received a copy of the International Telephone Directory "ATI" for 1930. It has increased considerably in size and is now printed in Spanish, as well as in English, French, and German. The number of entries have grown from 12,000 in 1,485 towns in 27 different countries, to 50,000 entries in 2,718 towns in 38 countries. It is worthy of remark that France, with a million telephones, has 8,688 entries as against this country's 5,009 with nearly two million telephones.

A provincial subscriber, writing to the District Manager with reference to his outstanding telephone account, concludes:—

"I cannot give you my address, as I am going abroad the end of Oct, we have no permanent address at present there, we are going to Canada, when this Quarters bill come in, and you will deduct the deposit I paid, I will pay the balance what is due, and then my responsibility ceases, has God knows where I shall be Jan. 1931, kindly let me know and oblige.
Yours sincerely."

Fortunately the information asked for was not the information actually required.

On Sept. 26 arrangements were successfully made for Mr. Arthur Loew, head of the Metro-Goldwyn-Meyer film organisation, to speak by telephone from New York with the members of the organisation and others interested in the picture industry, who were holding a convention at Sydney, Australia. Mr. Loew talked for 36 minutes to the gathering and the speech was very clear and satisfactory.

We note with much interest in our contemporary, *Le Relais*, of Paris, an article on the London Central Telegraph Office by our

old colleague, Jas. J. Tyrrell, especially the encomium preceding it in which he is described as

connu universellement dans les milieux télégraphiques par ses chroniques mensuelles de *The Telegraph and Telephone Journal* intitulées "Telegraphic Memorabilia" et signées de simples initiales J. J. T. Si un collaborateur de revues techniques a eu un jour le pouvoir d'insuffler dans les milieux télégraphiques des sentiments de fraternité universelle, c'est bien lui. En effet, pour écrire ses chroniques dans lesquelles toute la vie des communications télégraphiques se reflète depuis de longues années, il lui faut suivre les événements dans le monde entier. Cette recherche universelle constante, le fait d'avoir participé au trafic mondial dans un des plus grands centraux du monde ont permis à M. James J. Tyrrell d'acquérir une façon de voir dégagée de toute étroitesse, et imprégnée de franche camaraderie.

Our contemporary *Aquarius* (the magazine of the Metropolitan Water Board Staff Association) makes merry over the instructions in the Telephone Directory as to verifying letters by analogy, "thus, X for Xmas."

It calls this "NLOG in XLSIS" and adds "the following suggestions may be helpful:—

A for Eight.	N for Enervate.
B „ Zbysco.	O „ Au Revoir.
C „ Seal.	P „ Appear.
D „ Bdelium.	Q „ Curious.
E „ Æsop.	R „ Architect.
F „ Efficacy.	S „ Essex.
G „ Jean.	T „ Pterodactyl.
H „ Aitchbone.	U phe Mystic.
I „ Eyelid.	U for Wiesbaden.
J „ Gaol.	W „ Once.
K „ Cable.	X „ Excellent.
L „ Elevated.	Y „ Wyvern.
M „ Emerson.	Z „ Xerxes.

We wonder if our alert critic can suggest something better than X for Xmas. ("Excellent" begs the question in the same way as "Xmas"). Xenophon, Xerxes, and Xantippe might be considered as "highbrow" by the man in the street; "xylonite" is hardly a common article of commerce, and a "xebec" is an infrequent vessel of navigation in this country.

OUR Erratic Correspondent writes: "I am credibly informed that the Postmaster-General has standing authority to purchase watch-dogs and horses. We see statements in the newspapers that the growth of the telephone in this country is not as rapid as it should be. Are our Telephone District Managers, I ask, duly supplied with watch-dogs and horses? Of course not! Very well, then! What can you expect?

Our District Managers in vain
Seek high percentages to gain,
Yet telephone development
They scarce increase by ten per cent.
The reason's obvious, of course—
They have no watch-dog and no horse.

A Contract Manager, astride
A piebald charger, who should ride
Through market place and thoroughfare
With banners waving in the air
Inscribed: 'Consume more Telephones!'
In vivid gold and violet tones
Might capture many a wavering soul
With demi-volt and caracole.
And if the watch-dog, trained somehow,
Joined an encouraging "Bow-wow"
To each persuasive "Do it now!"
Dog-lovers, a warm-hearted tribe,
In countless thousands might subscribe.
But this can never be, of course,
While there's no watch-dog and no horse.

Some people complain that we are not pushful enough on the commercial side, and are continually urging more publicity. From

the following Press cutting, it would seem that there are others of a different opinion:—

The sales department on the telephone side is certainly persistent. I have had a telephone for 25 years, and am now trying to do without, hoping for rest and economy, but I must have had a dozen visits from a young man of the constructional side begging me, for the sake of my friends, for the sake of my wife and family, and especially for the sake of the unemployed, to have the telephone installed. I am getting so fond of this importunate young man that I should miss him terribly.

NOTE.—The publication of Mr. Sellars' useful "Brief Chronology for Students of Telegraphs, Telephones and Posts" will be resumed next month.

ROUMANIAN TELEGRAPHS AND TELEPHONES.

THE annual statistical report of the Roumanian Posts, Telegraphs and Telephones contains some interesting notes of the development of these services. It appears that during the Crimean War a French military company, under the command of Captain Lamy, constructed in Wallachia (Roumania not then existing as a State) the first telegraph line between Bucarest—Giurgiu and Rustchuk. After the departure of the French, telegraph working was continued by the Austrians, whose army occupied the country and who had constructed a telegraph line between Bucarest and Predeal (then in Hungary). In 1858, after the retreat of the Austrian army, the telegraph service in Wallachia was taken over by Roumanian officials; in the same year the first telegraph offices were opened in Moldavia. In 1859, after the two Roumanian principalities Wallachia and Moldavia, were united, the telegraph services were united under one director. The telegraph and postal services were united under the same director-general, Major Cesar Librecht, in 1864. The railway was introduced into Roumania in 1869, and the Gregorian calendar in the same year. The first law conferring a monopoly of telegraphs on the State was applied in 1865 and extended to telephones in 1886. Telephones were, however, first exploited by private companies, their working by the State being undertaken in 1893. In 1899 the first Roumanian submarine cable, that between Constanza and Constantinople, was laid. Wireless service was introduced into the country in 1914.

During the Great War and the occupation of the country by enemy forces, the services suffered an almost total destruction. On the aggrandisement of the country after the war, new problems arose for the Department, which was obliged not only to rehabilitate its system but to proceed with unification of the services in Greater Roumania. The telephone system alone has increased from about 20,000 stations in 1920 to 59,000 at the end of last year. Bucarest has 12,500 subscribers, of which 3,000 are on the automatic (rotary) system. Roumania is in trunk communication with Poland, Jugo-Slavia and Bulgaria; these at present are its only international telephone services. The telegraph system consists of 74,000 km. of wire (internal) and 5,570 km. international lines. There are 15 radio stations which transmitted in 1928 234,098 telegrams and received 178,996.

From *Europäischer Fernsprechdienst* we learn that the International Telephone and Telegraph Company has obtained the concession for the whole Roumanian telephone system, both trunk and local, the company providing the necessary wire, cable and wireless connexions. It is said to be on similar lines to that on which they acquired the Spanish system. The purchase price is stated to be about 800 million lei (818 lei = £1), and the concession is not limited as to term but the State has the right to buy back the undertaking at the end of 20 years subject to an addition of 15%. The company undertakes to establish a factory for telephone material, to convert the Budapest system to automatic working at once, and the 12 largest cities in five years, and also to lay down trunk lines to the frontiers of Poland, Hungary and Czecho-Slovakia. The State will receive 4% of the company's total receipts; and after paying 8% dividends and placing 2% to reserve, the company will divide any balance with the State.

PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

By J. J. T.

(Continued from page 4.)

As has already been mentioned, broadcasting and its exploitation in the U.S.A. is more closely connected with wireless point-to-point communication, telegraphic and/or telephonic, than is the case in this country, and the following admittedly lengthy excerpt from the *T. and T. Age* of Aug. 16 last throws considerable light upon the position and difficulties of all types of radio activities in that country. It will also doubtless enable readers to realise the arduous tasks submitted from time to time to the Federal Radio Commission for settlement. The editorial mentioned above reads as follows:—

"The Universal Wireless Communications Company, Inc., with main offices in Buffalo, N.Y., and its factories in Chicago, Ill., was placed in the hands of a receiver by the Federal Court in Chicago on Aug. 4. The company was organised about two years ago for the purpose of establishing a commercial network of wireless stations in 110 leading cities throughout the United States. Soon after the company was incorporated the Federal Radio Commission granted forty radio channels to the 'Universal' over the competitive applications of several other companies, including Radio C.A. Communications and the Mackay Radio and Telegraph Company. This grant provoked bitter controversy and was the basis of an inquiry by the Merchant Marine Committee of the House of Representatives. Radio C.A. Communications Inc. obtained part of the Continental channels it requested. The Mackay Radio and Telegraph Company received none of the contested Continental channels it requested, and the Intercity Radio Telegraph Company, for which a receiver was also recently appointed, failed to obtain from the Commission the channels it requested for the establishment of a nation-wide commercial wireless network. According to a report submitted by the 'Universal,' funds in excess of \$2,000,000 have been expended by that company in placing in operation about a dozen stations. The entire project of connecting 110 cities under the terms of its grant was to be completed by Jan. 1 1932.

"The allocation of the Continental short waves to the 'Universal,' made in 1928, is involved in litigation before the Court of Appeals in Washington, D.C., the R.C.A. Communications, Mackay, and Intercity companies having appealed from the Commission's channel distribution. The 'Universal' organisation was for some time after it was incorporated a deep mystery in radio circles, and there were strong suspicions that it had been formed by politicians to grab the wireless business of the country while in its infancy and push the deal over by sheer bravado and political pull. The company at that time had no record of extensive public service, no active wireless telegraph plant and no apparent facilities for distributing wireless telegrams, other than hiring messengers at a prohibitive cost for small business. It was little wonder then that a howl heard clear across the Continent went up from the long-established radio companies when the Federal Radio Commission suddenly announced that it had awarded forty of the choicest radio channels to a company which as yet hadn't done any business. There were intimations, however, that the backers of the new concern were so strongly entrenched that it would not do any good even to go to the courts; that there were millions and millions and millions of dollars behind the 'Universal,' and that the only decent thing for the struggling established companies to do was to die off!

"The Radio Corporation of America," continues the editorial comment, "and its telegraph wireless company have lived with their fighting clothes on twenty-four hours a day ever since the

Radio Corporation was organised, and Clarence H. Mackay, head of the Mackay Radio and Telegraph Company, as well as the Postal Telegraph and Commercial Cable companies, while not looking for trouble, has never been known to quit a legal or business battle for his rights. That is why some of the best legal talent in the country has brought the matter of a proper allocation of forty commercial radio wavelengths up to the Court of Appeals at Washington D.C., and is one of the reasons why the gally new rival has spent a couple of million dollars in vain and is now in a receivership."

There is no indication, so far as one can trace, as to how the "Intercity" organisation's affairs have been handled by the receiver, and one can only conclude that that company has gone out of business!

No wonder that American journals do not, at times, hesitate to write of radio conditions in that country as chaotic. One does not wonder that the Federal Radio Commission became fatigued at the end of its summer session, and that despite the 300 radio questions—telegraphic, telephonic, and broadcasting—still on hand, its members decided *nem. con.* to retire for a few weeks to Coney Island, or whatever may be the favourite recuperating rendezvous for sorely tried arbitrators in Jonathan Land. Long before these lines reach our readers the Commission will be in its place again, and soon after its return will have learnt that no less than thirty-one of its decisions are pending before American courts, and are not expected to be disposed of until some time this winter. The decisions, it is expected, "are likely to affect the Commission's policy," says *World Radio*. Two of the thirty-one cases are to be decided by the Supreme Court, while constitutional issues are involved in both.

Surely the Commissioners have earned their all too brief holiday!

(To be continued.)

REVIEWS.

"*The Elementary Principles of Wireless Telegraphy and Telephony*," by R. D. Bangay. Third Edition. Revised by O. F. Brown, M.A., B.Sc. Published by Iliffe & Sons, Ltd. xii + 268 pp. Price 10s. 6d.

The first two editions of this book are well known to all interested in wireless. At the time of their publication they were the best elementary account of the subject available. But wireless telegraphy advances so rapidly that nowadays the previous editions are badly out of date, and the present edition, revised to include the modern developments of the subject, will be welcome.

The book, as now produced, covers the whole field of wireless, including such modern developments as four- and five-electrode valves, tuning fork and quartz control of transmitters, A.C. and D.C. eliminators, the latest types of loudspeakers, short-wave working and direction finding. It concludes with a chapter dealing with the propagation of waves and atmospherics.

The book is excellently produced and should find a warm welcome from all who wish to obtain a comprehensive general view of the subject without going deeply into the technical details necessary only to the specialist.

"*Handbook of Technical Instruction for Wireless Telegraphists*," by H. M. Dousett, M.I.E.E., F.Inst.P., M.Inst.R.E. Fourth Edition. Published by Iliffe & Sons, Ltd. xix + 487 pp. Price 25s.

This well-known textbook for students for the Postmaster-General's certificate of Proficiency in Wireless Telegraphy has now reached its four edition. Owing to the developments of the subject since the third edition appeared in 1923, in the present edition the matter has been entirely recast, and the scope of the book has been

widened to meet the more exacting requirements of the duties of the sea-going operator of to-day.

The latest developments of marine wireless are dealt with, including multiple grid valves, direction finding, distress call apparatus, and the special sets used on lifeboats and for emergency purposes.

The standard of the previous editions has been well maintained, and the book should be as helpful a guide to the new operator as the previous editions have been in the past.

"The Selenium Cell: Its Properties and Applications," by G. P. Barnard, of the Electricity Department of the National Physical Laboratory. 331 pp. Published by Messrs. Constable. Price 35s.

Selenium is a substance which changes its resistance under the action of light. It is used in the form of a cell, where light is required to control an electric current. The Selenium cell is in direct competition with the more recently invented alkaline photo-cell, which is used for the same purpose. It might at first sight be thought that the Photo-cell would supersede the Selenium cell for all purposes on account of the erratic behaviour of the latter, but a perusal of this book will convince those with insight that this is far from being the case and that for some purposes the Selenium cell is definitely superior to the photo-cell as at present made.

The book starts off with a preface by Mr. J. W. T. Walsh, of the National Physical Laboratory, followed by the author's preface where he states his reasons for writing the book and the particular arrangement he has adopted in its make-up.

A table of contents and a list of illustrations or diagrams, of which there are 258, follow the preface and are followed in turn by a list of abbreviations.

The first five chapters comprise Part I, which deals with the history, construction of cells and the properties of the material; Chapter V, concluding Part I, puts forward some of the theories which account for the action of light on Selenium. Chapters VI to IX give some of the practical applications of the Selenium cell which range from the turning on and off of street lighting lamps, burglar alarms, magnifier for the current received over long submarine cables, counting, photometry, telephony with light leading up to the talking film and television. The subject matter in each chapter is divided into numbered sub-heads, the numbers running consecutively through the book. At the end of each chapter a list of references is given. Five appendices follow. Appendix I contains a list of books and reviews arranged in date order, commencing with 1879 and going up to 1929. Mechanical and Thermal Constants are given in Appendix II, the Optical Constants in Appendix III, and last, but not least, the Electrical Constants in Appendix IV. In the final Appendix a schedule of standard tests for a Selenium cell is given. A useful index completes the book.

The year of publication 1930 is given on the title page, a thing not always done nowadays. The printing is good and the diagrams are clear.

The book should appeal to those who have to design, manufacture, or operate devices which are or can be controlled by the intensity of a beam of light.

E. S. R.

"Elementary Mathematical Astronomy," by Barlow and Bryan. 4th Edition. Revised by A. C. D. Crommelin, D.Sc., B.A. Published by University Tutorial Press Ltd. xvii + 445 pp. Price 9s. 6d.

Among the various branches of applied science a knowledge of which is necessary for a fully qualified telegraph engineer, is included surveying, and in order that certain surveying operations

can be carried out intelligently and not merely by rule of thumb, some acquaintance with the principles of mathematical astronomy is required. The ordinary popular books on astronomy are not suitable for this purpose, as they are mainly descriptive, while the standard mathematical treatises on the subject are far too voluminous.

The book under review falls into the interval between these two classes and exactly meets the needs of anyone who requires only an elementary acquaintance with the subject.

The whole ground of position astronomy is covered, and, in addition, sufficient information on the geometry of the sphere and the ellipse is given to enable the student who may not have previously studied spherical geometry or conic sections to follow the portions of the book where a knowledge of these subjects is required. In the present edition the subject matter has been brought completely up to date, a note being even included on the new planet, Pluto, which was only discovered on Jan. 21 this year.

The book can be strongly recommended not only to those who need the information it contains for professional purposes, but also to the general reader with an elementary knowledge of mathematics who wishes to obtain some insight into how the wonderful structure of present-day mathematical astronomy has been built up.

"Principles of Electric Power Transmission." H. Waddicor. Chapman & Hall. 21s. net.

In view of the recent very rapid expansion of electric power transmission systems by means of overhead wires or underground cables, notably in connexion with the Grid system, it is incumbent on all power engineers to make themselves acquainted with the principles underlying the design and operation of such systems. The present volume, while primarily intended for the use of advanced students, should also be of considerable utility to designers and engineers in charge of the operation of transmission systems. That it meets a demand in such cases is proved by the necessity for this second edition which contains a complete new chapter on the power limits of transmission systems.

The information given is for the most part not novel, but has been collected from a number of sources and is here presented in a very convenient form. The utility of the work is increased by a number of fully worked numerical examples, and although the author does not claim that these exact mathematical solutions are necessary for all line calculations, yet they must form the basis of all approximate methods such as charts and nomograms, and in some cases problems cannot be solved without their assistance.

The text is well illustrated by a number of diagrams.

"The Technique of Efficient Office Methods," by P. T. Lloyd (Secretary's Office). Gee & Co. (Publishers) Ltd., 6, Kirby Street, London, E.C.1. Price 10s. net.

This book deals generally with the principles of accounting in its modern aspects and the aid which can be afforded by machines and other up-to-date developments. Mr. Lloyd emphasizes one fact that it is necessary to examine carefully the office needs before deciding upon the adoption of any new system, and he demonstrates that changes of existing accounting procedure are often essential before a new mechanical system can be adopted with due regard to economy and efficiency. "Is this operation or section of work really necessary?" is the problem which he considers should first be solved. His expert opinions may be regarded as useful antidotes to the *ex parte* statements in advertising literature; and the perusal of this book may save one with less knowledge of the subject from falling into the mistake of purchasing too elaborate and expensive apparatus for the objects in view.

TELEGRAPHING IN NAIROBI.

By W. T. SMITH, KIRBY-MUXLOE.

IN these days of teleprinters, "shadow" circuits, and picture telegraphy it is perhaps interesting to recall one's experiences in lands where time is not such a priceless commodity as here in Europe.

I well remember my first circuit in Nairobi. Fresh from home and the somewhat strict test applied to incoming telegraphists to the Protectorate I settled down at a double current key and rattled off at a good 30 w.p.m. a Government telegram of several hundred words in length to a distant settlement. Turning my switch I waited expectantly for the "RD." A few minutes elapsed then the words: "Go and die!" slowly tapped themselves out. Bewildered, I turned to my neighbour, a girl: "Oh! He's such a funny Indian," she said. "You have to send very slowly!"

We had a buzzer circuit in Nairobi which was of the omnibus variety, and embraced practically all the settlements lying westward along the Uganda Railway. At the best a buzzer circuit is a trial of patience, but given experts (?) of every shade of Indian the result can easily be pandemonium. In the middle of transmitting with painstaking toil a short commercial telegram an earsplitting crescendo would suddenly drown everything with: "Has the 'UP' train left, Haljee?" "After what?" I would attempt. "Keep off! Keep off! Haljee, tell Baljee Waljee to bring two tins of sardines and four boxes of matches on the 'UP' to-day!"

In Kisumu there was an old-fashioned repeater which relayed the signals from Nairobi to Jinja, Kampala, and Entebbe. One Sunday I was dozing, I am afraid (Ksu is very hot), and was startled to hear on the relaying sounders:—

"You no d—— good, K——!"

"Why you swear at me, J——?"

A few other sentences followed expressing marked, too marked, personalities, when a crash of atmospherics rattled the repeater. Both stations immediately called "KSU" furiously: "Adjust! Adjust repeater! You are delaying important work!" I deemed it necessary to earth the repeater for a time.

I will conclude by a reminiscence which occurred during the war. On a certain buzzer line which could also be used telephonically during certain hours, there were four stations, A, B, C and D.

At H.Q. the telegraphist in charge was a broad Yorkshireman. Five-thirty a.m. saw him busily engaged in tuning up. To the four waking telegraphists it resembled a gramophone with a perpetual alternating speed. Then it stopped:—

"Are yer there A?"

"Yes!" very sleepily.

"Are yer there B?"

"No!" somewhat angrily.

"Are yer there C?"

"Yes! Yes!"

"Are yer there D?"

No answer.

Louder: "Are yer there D?"

"Course I am yer blethering idiot!"

H.Q. took a deep breath: "Stand-by for the war news. Are yer all standing by?" A death-like silence.

"There ain't none!"

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Aug. 31, 1930, was 1,923,406, representing a net increase of 7,348 on the total at the end of the previous month.

The growth for the month of August is summarised below:—

Telephone Stations—	London.	Provinces.
Total at Aug. 31, 1930	690,400	1,233,006
Net increase for month	2,070	5,278
Residence Rate Subscribers—		
Total	171,826	268,058
Net increase	863	1,472
Call Office Stations (including Kiosks)—		
Total	6,333	26,437
Net increase	64	199
Kiosks—		
Total	1,980	6,925
Net increase	55	84
Rural Party Line Stations—		
Total	—	9,724
Rural Railway Stations connected with Exchange System—		
Total	17	1,815
Net increase	—	29

The total number of inland trunk calls dealt with in June, 1930 (the latest statistics available) was 10,116,181, representing an increase of 445,512, or 4.6% over June, 1929.

Outgoing international calls numbered 44,076 and incoming international calls 47,157, representing increases of 1,126 (2.6%) and 871 (1.9%) respectively over June, 1929.

Further progress was made during the month of September, 1930, with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Romford.

PROVINCES—Ash Bank, Ashley, Ballygawley, Cawood, Capdock, Drayton, Dunnington, Elmsted, Hallbankgate, Harwell, Ingrams Green, King Edward, Netherstowe, Rawcliffe, Roslin, Sandon, Sigglesworth, Spearbridge, Swarton Morley, Ubbeston, Whipsnade, Whitton-le-Wear (all rural automatic); North Shore, Blackpool, South Shore, Blackpool (both automatic); Hindhead, Marple,

and among the more important exchanges extended were:—

PROVINCES—Blackheath (Birmingham); Darlington (auto.); Long Eaton, Midland (Birmingham), Northwich, Penzance, Plymouth, Ruislip, Shirley, Taunton, Tipton.

During the month the following additions to the main underground system were completed and brought into use:—

Canterbury—Dumpton Gap,

while 73 new overhead trunk circuits were completed, and 78 additional circuits were provided by means of spare wires in underground cables.

TELEGRAPHIC MEMORABILIA.

PERSONALLY the writer is not unduly enamoured with exhibitions. He could not, however, resist an invite to the Olympia Radio display this year, and admits to being well repaid for the effort to get there, despite the transport difficulties of a drenching, blustering night, and the crowded condition even of the additional space this year allotted to exhibitors. These columns are not the most suitable place for a description, or for criticisms, were one so inclined, or qualified even, to picture one or adjudicate the other.

The general effect of the exhibition as a whole was its youth and vitality. This was not alone due to the exhibitors, but very largely to the heavy percentage of young men who had paid for admittance and who were evidently keen on the technicalities of wireless. Many of these were very seriously discussing with one another or with the stall-holders the merits and de-merits, the pros and cons concerning almost everything, from a gadget in "spade-terminals" to the latest effort by Ferranti in moving coils. When one hears so much concerning the frivolity, the thoughtlessness, and the general lack of interest of the youth of to-day in the realities of the present age, here at least the croakers could have found but little fault with the attitude of the 18 to 25 category towards scientific problems of the radio science. Oh no, I had not forgotten the B.B.C. Dance Hall in the gallery, where there were certainly not a few engaged in terpsichorean activities who were well beyond the maximum age-limit mentioned above! To anyone whose knowledge of wireless is restricted on the technical side, the task of visiting so vast a building as that of Olympia with the idea of deciding upon the purchase of a suitable receiving set, is simply bewildering, especially as the gramophone appears to have become so mixed up with the latest in receivers. One is, in fact, in the constant fear of taking home the wrong piece of apparatus. Thus the writer found safety in spending eighteen pence upon a few spare connexions of a new type, the efficiency of which he has not yet had time to test, and also came away with the following wireless yarn which maybe the Editor will permit him to try-out on readers of the *T. & T. Journal*.

"He was an engine-driver on the — railway, and was proudly showing off his home-made wireless set to a chum. 'Yes,' he said, turning to his friend, 'I made her, myself, Joe.' 'No doubt about it,' was the reply, 'I can well believe it, for she whistles at every station like the Down Mail.'"

It is feared that my scribblings will appear somewhat discursive this month, due to inability to settle down after a week or two away from the Metropolis, but the two following items appear to be worth while recounting, referring as they do to telegraphs and telephones alike, yet each case unique in itself. No. 1.—The French Post Office, it appears, has an arrangement by which in certain French villages the postman performs the duty of a telegraphist and/or a telegraphist or counter clerk. Now these functionaries are supposed to perform eight hours per day, but many of them actually *work* ten hours although they are only *paid* for eight! This unfortunate section of the service is known, I believe, as the Sixth Class. It is argued by the French Authorities that, while an official is actually delivering letters he is occupied (*occupé*) for sixty minutes of every hour, but that while acting as a counter clerk, a telegraphist, or telephonist, or all rolled into one in the smallest of offices, he may be sitting idle or waiting for a call, &c., &c., and, therefore, while performing such duties, 70 minutes and not 60 constitute an official hour, only pay for a 60-minute hour being due accordingly! No. 2.—Describing certain social and economic conditions in Russia to-day, a special correspondent of the *Daily Telegraph* remarks upon the scarcity of small change, and how the difficulties are met—in certain cases. For example, the all-round tram fare in Moscow is ten kopeks. Should a three

rouble note be tendered, the conductor is generally loth to part with small change and declines to accept the note, so you wait until the next tram-stage and alight. You then board the car following the one you have just quitted and try again. Not infrequently this conductor will repeat the formula of his predecessor, and the passenger has no alternative but to repeat his actions also. It is thus quite possible, therefore, to reach your destination free of charge, and that, apparently, legitimately! The Post Office Service is, however, more alert. Here, also, there is the same dearth of small change, but, for instance, should you wish to send a telegram, it is not always that the exact cost of your telegram can be estimated, but sufficient money must be deposited as cover. When the sender later on returns for his change, the same is paid to him in postage stamps, whether the customer requires them or not!

Personal.—It is with no little pleasure that the appointment is recorded of Mr. A. J. Pratt, Sectional Engineer of the Post Office Telephones, Liverpool, to the Chairmanship, for the current session, of the Mersey and North Wales Centre of the Institution of Electrical Engineers. Mr. Pratt entered the Post Office service in 1900 as an engineering clerk in Nottingham, and was educated at High Pavement School and the University of the last-mentioned city.

The premature retirement of Mr. J. Prout of the Cable Room last month, on medical grounds, removes a happy personality from the staff of that section of the C.T.O. I understand that he is moving to a small seaport on the Sussex coast. All those who have ever met him or worked side by side with "Jack" will join in the sincerest hopes for renewed health and strength.

Retired Officers of the C.T.O.—On Sept. 18 last a small conference of this body met at Bournemouth Waterfalls: Messrs. F. W. Harrison, J. G. Hopgood, L. Morgan (late Postmaster of Trowbridge), C. S. Keen, and J. J. Tyrrell being present. An apology for enforced absence was received from Mr. H. G. Buckman, late of T.S., ex Postmaster of Matlock Bath, &c. News was also received of the well-being of Arthur Avery, somewhere in Kent, enjoying life "balancing" between gardening, golf, and bowls, and of Mr. Arthur Ward, still well and happy at Watford. Subjects discussed: "The foibles and idiosyncracies of old and absent colleagues, and the charms of those present"!

Companies.—W. Union Telegraph Co. Quarterly dividend of \$2 per share on common stock payable Oct. 15. Eastern Tel. Co., Ltd., payment announced of dividend at rate 3½% per annum, less tax on pref. stock for qr. Sept. 30. Direct Spanish Tel. Co., Ltd. In addition to dividend for half-year to June 30 last at rate of 10% per annum on prefs., an interim dividend of 3% tax-free on ordinaries. The I. & I. Communications, Ltd. traffic figures for August last are estimated at £411,090, a decrease of £81,270 compared with August 1929. Aggregate from Jan. 1 £3,656,033 against £4,115,503, a decline of £459,470, or 11.2%.

Countries.—AUSTRALIA.—The Government of Australia, it is understood, intend to continue the policy of erecting broadcasting relay stations in unsatisfactory centres, and is expected to call for tenders shortly for more new stations. The Postmaster-General has expressed the hope, says *The Electrical Review*, that local firms will get future contracts, although hitherto the Government has been compelled to accept outside tenders. A wireless telephone service between Australia and New Zealand is expected to be opened shortly. BELGIUM.—It is stated on the authority of Belgian newspapers that, as a result of a contract entered into between the Belgian Government and an Italian company, that a submarine cable has just been laid in order to connect the Belgian system with South and North America. The first section (that between Lisbon and La Panne) is due to be opened as these lines go to press. It is 2,800 kilometres in length. BRAZIL.—The Official Gazette of the Brazilian Government has published a decree granting the right to the *Companhia Radio Internacional do Brazil*, an associated company of the I.T. & T. Corporation, to construct

radio telegraph and radio telephone services from Brazil. The concession is for ten years, says a South American source of information, and it is planned to install radio telephone and telegraph stations as soon as possible with the United States, Europe, and the South American countries. *Memo.*—This information is dated prior to the outbreak of the present revolution. CANADA.—According to Reuter's Ottawa Agency, two new avenues of communication with the Far North have been completed by the installation of wireless stations at Coppermine, on Coronation Gulf, and at Chesterfield Inlet, on the North Western shore of Hudson's Bay. There is now an interconnecting wireless chain around the Canadian mainland from the Mackenzie River in the Arctic to Port Arthur on Lake Superior, via Coppermine to the Hudson's Straits Division, thence down the east coast of Labrador to the Atlantic division and then joining the St. Lawrence chain and the Great Lakes system. Transportation of the construction crew, it is interesting to observe, was effected by aeroplane. Their equipment had been taken north from Vancouver through Behring Strait earlier in the year. Men and material for the station at Churchill were carried by a steamer which sailed around Labrador and through Hudson's Bay. CHINA.—The Nationalist Government has issued a mandate announcing its decision to cancel existing contracts with the Eastern and the Great Northern Telegraph Companies upon their expiry at the end of the year. It is also announced, says Reuter's Agency at Nanking, and other Chinese sources, that from this date henceforward, no foreign government or corporation or individual may secure a monopoly of cable landing rights. The Nanking Foreign Office has been instructed to notify the companies concerned and the Japanese Government of these decisions. The Chinese Ministry of Communications states that the construction of the large radio station at Chenju, near Shanghai, has been completed. The station is to be used for the dispatch and receipt of messages to and from Europe and America, and should be in full operation by the month of November. COLOMBIA.—Reuter's Trade Service at Bogota informs us that a contract has been awarded to a German firm for the installation of broadcasting facilities at the Colombian radio stations. A commencement is to be made with the Bogota station, the work involving the provision of entirely new equipment, rendering it possible to broadcast simultaneously on long and short waves. FRANCE.—The French press announce the imminent construction of a new 12 kw. transmitting station situated about 62 miles from Paris. The studios are to be in Paris itself. The launching of a new 3,915-ton cable-laying steamer, *L'Ampère*, recently took place at La Cistat, near Bordeaux, and is intended for the submarine cable service of the French P. and T. Authorities. FINLAND.—The power of the broadcasting station at Viipuri is shortly to be raised from 0.4 kw. to 10 kw. There are actually six Finnish stations, Lahti 40 kw. and Helsingfors 10 kw. and four smaller stations. The Government collects the licence fees, retaining part thereof for the upkeep of the transmitters which are State maintained, and the remainder of the revenue from the 100,000 licenceholders goes to the private company which provides the programmes, which company was formed by the co-operation of societies having educational aims, says *The Electrical Review*. GERMANY.—*The Wireless World* states that it has been decided by the German broadcasting authorities to increase the power of the Koenigswusterhausen (Zeesen) from 35 kw. to 50 kw. GREAT BRITAIN.—The Marconi International Marine Communication Co., Ltd., London, has on order the manufacture and installation of nine wireless sets complete with direction-finders on new vessels of the British Tanker Company's fleet, says the *Electrician*. Those competent to judge appear to agree that the 100 kilowatt transmitting valve designed in Great Britain by the Marconi-Osram combination for use in the, at present, world's largest broadcasting station at Warsaw, is a radio masterpiece. It has the extraordinary life of 4,000 hours, and the filament current is said to be well over 200 amperes. HOLLAND.—Reuter's Hague Agency declare that a wireless telephone conversation in which the spoken words were transformed to such a degree as to be completely unintelligible to illicit listeners, and then so retransformed on reception as to be understood by the receiver, has been held between The Hague and the Dutch East Indies. The transformation of the words is done

automatically, so that alteration of apparatus or wires is not necessary. HUNGARY.—*The Wireless World* announces that plans are maturing for the construction at Budapest of a powerful new broadcasting station, modelled on the lines of the British regional stations. Two programmes will be transmitted simultaneously. INDIA.—Reuter's Bombay Agency understands that as the result of negotiations between the Indian Radio Telegraph Company, Mr. Kuchida, chief of the Japan Wireless Service, who is at present in India, and the Indian Government, it is probable that a Beam wireless service will be established next year between India and Japan. It is even understood that certain preliminaries have already been settled, and it is expected that further progress will be made with the return of Sir Ness Wadia, who is expected in Bombay shortly. The annual report on the working of the Indian Posts and Telegraphs Department, among many interesting items, states that the telegraph and telephone mileage during the past year has been increased by several thousand miles of conductors. At the end of the year over 100,000 miles of line were maintained by the Department. A special short-wave transmitting set with suitable receiver was installed at Karachi, with a view to providing direct communication with Baghdad and Aden, in connexion with civil aeroplane and airship service. The direction finding installation at Santa Cruz, near Bombay, was completed and made ready for service. IRISH FREE STATE.—The daily press of mid-October announce that a contract for the erection of a high-power broadcasting station in the centre of Ireland has been placed by the Free State Department of Posts and Telegraphs. The power of the station will be 60 kw., and it is expected that the station will be erected at Athlone or Birr. According to *The Times* and *Daily News*, the contract has been given to Marconi's Wireless Telegraph Company, Ltd. ITALY.—*The Electrical Review* informs us that the Italian Post and Telegraph Authorities are at the moment carrying out experiments with Creed automatic long-distance telegraph apparatus. The system has been in use for some time between Rome and Pisa, a distance of 200 odd miles, and is stated to be giving very satisfactory results. From Reuter's Rome Agency we learn that Italy is about to install the necessary apparatus on moving trains to permit of passengers listening to the broadcast programmes. Earphones will be available for a small charge payable to the guard. A start is to be made on slow trains between Rome and Turin. POLAND.—The high-power broadcasting station now in course of installation at Warsaw and mentioned above under "Great Britain," will not only prove to be the most powerful so far established in Europe, but, says *The Electrical Review*, will practically be the most powerful allowable under the Hague Convention. PORTUGAL.—*The Italcable Company*, which recently laid a cable between Belgium and Portugal, is now about to lay one between Lisbon and Malaga. Both cables are of the most modern type, and, according to Reuter's Agency, that between La Panne and Lisbon (Santo Amaro de Geiras) is capable of transmitting 1,400 letters per minute, duplex. The Lisbon—Malaga cable weighs 6,500 tons and is 1,300 miles in length. (See also under Belgium.) PORTUGUESE EAST AFRICA.—A radio telegraph service between Portuguese East Africa and the Portuguese colony of St. Thomé and Príncipe is to be inaugurated shortly. RUSSIA.—*World Radio* predicts an intensive development of the Russian broadcasting system before long, and states that several new stations are approaching completion. It is announced, from Moscow apparently, that tests have begun with a new transmitter situated at Kolpino, 16 miles south-east of Leningrad, the power of which is given as 75 kw. It is further stated that the "five-year plan" of "radification" provides for the erection of a number of high-power and "super-power" transmitters to serve Central Russia. These will be situated at Bogorodsk, 35 miles east of Moscow, and the first, which is now nearly ready, will have a power of 100 kw. The high-power Moscow station has recently taken the place previously occupied by Kharkov on 1,304 metres, while Kharkov has moved to a lower length. SOUTH AFRICA.—*World Radio* also supplies the information that, owing to the present bad financial times which the African Broadcasting Campaign has experienced from the beginning, the Government has decided, as from September last, to increase the scale of licence fees for listeners

outside the 50-mile radius. SWEDEN.—A service of picture-telegraphy is now open between Sweden and Great Britain. From *The Electrical Review* and *World Radio*, we gather that the State Telegraph Administration has requested the Swedish Government for about £8,000 in order to erect three broadcast stations in replacement of some old transmitters. It is intended to operate the new stations on the Swedish national wavelength of 231 metres (1,301 kc/sec.), and the Telegraph Administration purposes to replace successively nearly all the 23 relay stations in that country. The transmitters will be of an entirely new type, using no running machinery, and will be operated automatically, or semi-automatically, in order to reduce the running costs. The aerial power will be 300 watts. The Administration is of the opinion that *the present international common waves, sooner or later, will be taken into use for exclusive waves.* (Italics are editorial.) Thus the step now taken is made in order to meet in advance decisions that may be agreed upon by future international conferences.

SWITZERLAND.—*The League of Nations Wireless Station.*—*The Times* states that an agreement has been reached between Marconi's Wireless Telegraph Company and the International Standard Electric Corporation, the Compagnie Générale de Télégraphie sans fil (France), the Telefunken Company (Germany), and Messrs. Philips Lamps Co. (Holland) upon the terms of a contract for the construction near Geneva for the League of Nations of short-wave transmitting and receiving stations, including eventually a wireless-telephone station. The terms of the contract will now be submitted to the Secretary-General of the League.

UNITED STATES.—*Mr. Donald Murray's prophecy comes true!*—Setting type by telegraph in a series of distant newspaper offices by the operation of a typesetting machine in a central office is now an accomplished fact. It may be witnessed daily by those favourably situated on the newspapers served by the "News" wire of the Westchester County Publishers Incorp. of White Plains, N.Y., says our informant, the *T. and T. Age*. It was first publicly demonstrated in the office of the *Rochester Time and Union* on Dec. 6, 1928. Newspaper type was set by telegraph on that date within the confines of one room. "Mr. Walter W. Morey," continues our contemporary, "is the inventor of the apparatus, aided by experts from the then Morkrum-Kleinschmidt Company, now the Teletype Corporation." The *Electrician* notifies us that the American Telephone and Telegraph Co.'s application to lay a cable between Key West (Florida) and Havana (Cuba) has been approved. The *New York Times* intimates that the Columbia broadcasting system has filed an application, through a subsidiary, with the Federal Radio Commission for an experimental television station to be located in New York. It is asked for a construction permit to build a 500-watt visual broadcasting station to operate at a frequency of 2,778 kilocycles.

Lines written on the death of Fawcett, the blind Postmaster-General, November, 1884, from "Moonshine," Nov. 15, 1884:—

"We differed often, 'twas our common pride.
What gain to either now, the truth denied?
The past is past; the dead take not, nor give;
And men must differ if the world would live."

"Farewell, then, Fawcett,—politics apart,
Higher than these thy plucky British heart,
Better than all thy service in debate,
Th' example of the sightless—conq'ring fate."

Moonshine was one of three outstanding humorous weeklies in the political field of the 'eighties; the other two being *Punch* and the latter's *vis-a-vis*, *Judy*. Only the veteran hunchback has survived.

J. J. T.

ABERDEEN NOTES.

Two members of the District Office Staff, Aberdeen, have left the service in view of their approaching marriages.

Miss E. H. Robertson, W.A., was presented with a case of cutlery, and Miss J. F. N. Gibb, F.C.O., with a case of fish forks and knives.

Both officers are taking long journeys, Miss Robertson to China and Miss Gibb to India.

AUTOMATIC TELEPHONE PROGRESS.

WE have remarked before in these pages on the type of person who returns from abroad and writes to the newspapers saying "They have automatic telephones in Kashgar (or Karakorum, or Kalgourlie, or Königswusterhausen, as the case may be). Why can't we have them in England?" The answer to this somewhat easy conundrum is: "You have—although not perhaps in your native town or suburb." It is obvious that it is neither practical nor economic to convert the whole telephone system of a country with an up-to-date manual service to automatic working straight away, any more than an efficient railway system can be converted from steam to electric working except piecemeal. Indeed, the latter process has been very much slower than the former. Electrical railway services after thirty years still form an inconsiderable portion of the whole, while automatic telephony in a much shorter period has been extended to 20 to 25% of most modern telephone systems. It is to this fact which we think is in general imperfectly appreciated that we wish to draw attention.

There are at present (or, at least were, at the end of June) over 430,700 of the 1,911,800 telephone stations on the Post Office system working automatically a proportion of over 22%. In London 168,000 out of 686,800 had been converted, and the process here is steadily progressing. Of the largest cities in the country (those with upwards of 400,000 inhabitants) Leeds, Sheffield, Edinburgh, and part of Manchester are working on the automatic system; in the towns with 200,000 to 400,000 population, Bristol, Nottingham, Portsmouth, Stoke-on-Trent, and Leicester are so working, whilst Newcastle-on-Tyne will shortly be added to their number; in the towns with over 100,000 inhabitants, Southampton, Brighton, Middlesbrough, Dundee, Coventry, Blackburn, Burnley, Swansea, Southend-on-Sea, and Stockport may be counted, whilst amongst those with 40,000 to 100,000 are, amongst others, Bath, Bedford, Blackpool, Chatham, Colchester, Cheltenham, Darlington, Exeter, Gloucester, Hartlepool, Halifax, Maidstone, Ipswich, Newport (Mon.), Oxford, Paisley, Rochdale, Southport, Walsall, Dudley, and York.

In addition there are about 150 exchanges of the rural automatic type in small places serving about 2,500 stations. As the process of conversion is a continuous one, these figures are soon out of date, and another few months will show a considerable increase in the percentage quoted. Enough has been shown to demonstrate that far more than a few provincial towns and an odd exchange or so in London are worked by machine switching—as casual comments would often lead one to suppose.

LIVERPOOL NOTES.

ANOTHER advance in the Liverpool Telephone District is the opening of a new C.B. exchange at Neston, to replace the old magneto board. The new equipment is housed in a handsome up-to-date building with all modern improvements and is in great contrast both as to size and appointments with the old exchange. In fact, as in many other removals of this type, it is like changing from a humble cot to a palace. There will, of course, be a corresponding change in the service. A small function inaugurated the opening, the Chairman of the Urban District Council, J. Cotterill, Esq., J.P., and members of the council, meeting the District Manager and officials. The lighter relief from the official function is provided by light refreshments presided over by the lady members of the staff.

Neston, which now has some 300 subscribers, is romantically situated on the Dee Estuary and, with its environs, is becoming more and more a place of residence for important merchants and business people from the nearby Port of Liverpool. It is hoped, therefore, that development commensurate with the increased facilities installed will follow.

In connexion with the offer of transfer from the Post Office to the Ministry of Labour for members of the Writing Classes, Misses A. Harrison, E. Allen and M. E. Clark have taken up duty at Warrington, Wigan and Preston, respectively, under the conditions provided in the official circular.

Miss Allen's recent contribution to the *Journal*, over the initials E. A., will doubtless have been read with interest by many readers.

NOTES ON VISITS TO EUROPEAN WIRELESS STATIONS.*

BY A. H. READ, M.ENG., AND R. G. DE WARDT, A.M.I.E.E., M.I.R.E.

BEFORE reading the few notes obtained during visits to a number of wireless stations in Europe, we propose, for comparative purposes, to sketch a very brief survey of British development on the point to point telegraph side. We shall deal only with Post Office activities, but it will, of course, be remembered that the Marconi Company have also developed extensive and efficient wireless services between this country and European countries not served by the Post Office wireless routes.

We shall not attempt to cover wireless development in Europe generally and can only, in the time at our disposal, give you a few impressions and particulars obtained in the course of very brief and rather hurried visits.

The Post Office Anglo-European wireless services started with one or two isolated stations, at which both reception and transmission of wireless traffic was effected, the traffic being passed to and from the inland system over land lines. Progress since that time has been along lines which are common to all countries. The first step was to separate the receiving and transmitting sides in order to permit of continuous operation of both, i.e., duplex instead of up and down working. The transmitter was controlled from a key placed alongside the corresponding receiver situated some miles away. The next step was for receivers and control keys to be concentrated at one traffic centre in London (the old Berlin Room, later the Central Wireless Office). Reception difficulties in the heart of the city and improvements in receivers led to the construction of a relaying receiving station. This station was erected near St. Albans, and now relays incoming signals to the Central Radio Office in the Central Telegraph Office, London. The transmitter control keys are associated with the various receiving points in this office. The final step has been the concentrated grouping of transmitters—a more economical arrangement than that of having a number of isolated transmitting stations.

As a result of these developments the Post Office now has:—

At Rugby, one high-powered long-wave transmitter G.B.R. and one medium-power transmitter GBV. (There are also a number of telephone transmitters at this station.)

At Leaffield, in Oxfordshire, 3 medium-power transmitters and 2 short-wave sets (now being increased to 4).

At St. Albans, 10 long- and medium-wave and 2 short-wave receivers; 3 additional short-wave sets are projected.

In the Central Radio Office, or C.R.O., where all traffic is handled, are the transmitting control keys, and Wheatstone transmitters, together with

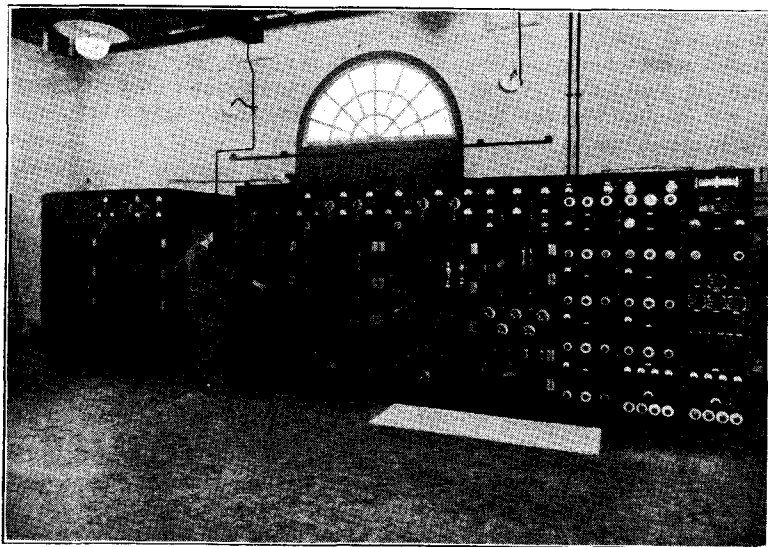


FIG. 1. LATEST P.O. TYPES OF TRANSMITTER, RUGBY.

their associated reception points and automatic recorders. The traffic operation is thus in close contact with the inland and other foreign traffic circulation systems.

The Rugby long-wave high-powered transmitter, largely employed on broadcast work such as the British Official Press and L.D.R. services to

* Paper read before the Post Office Telephone and Telegraph Society of London.

ships, is the most powerful of the world's valve transmitters, and the transmitting frequency, 16 kc. (or wavelength 18,750 m.), is kept constant by a valve-maintained tuning fork, also found in medium power sets. In this case the tuning fork vibrates at 1,777.7 cycles per second, from which the 9th harmonic is selected, and this controls, through a number of valve amplifying stages, a final aerial power of 500 kw.

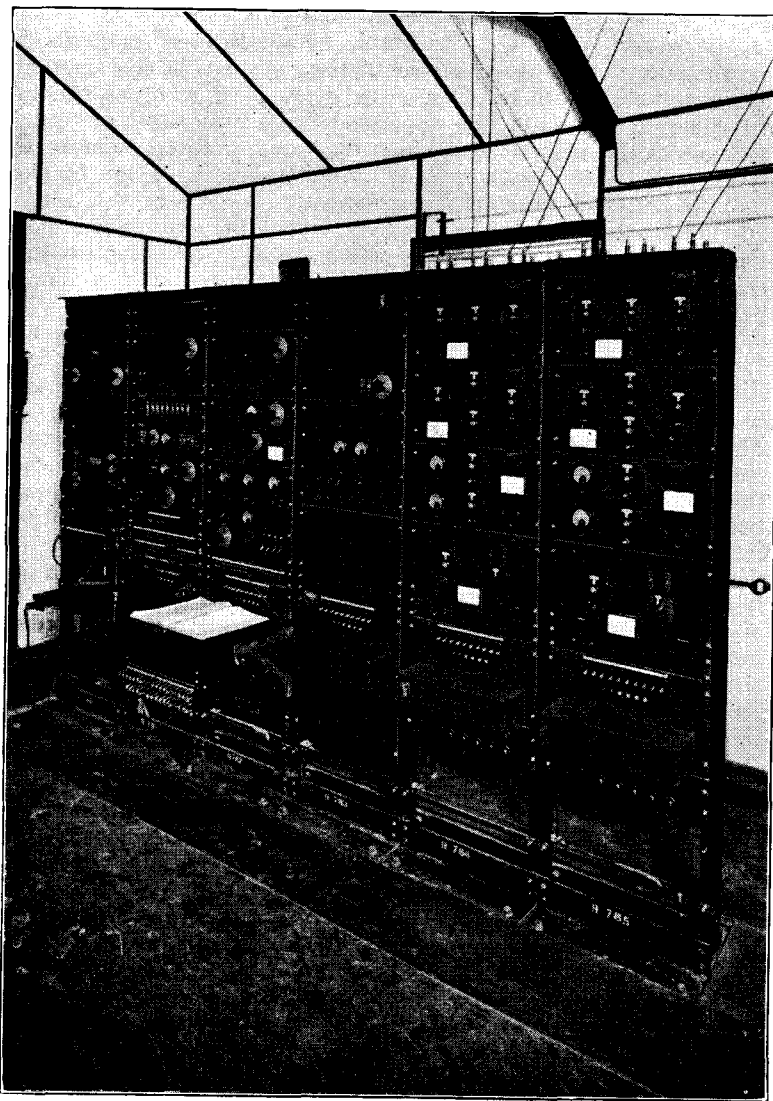


FIG. 2. P.O. SHORT-WAVE RECEIVERS FOR TELEPHONE RECEPTION, BALDOCK

The high tension supply to the output stages of this transmitter is produced by 2/6,000-v. D.C. generators operating in series and driven by synchronous motors from the public supply, 12,000 v. 3 ph. 50 v. In the medium power sets the supply is obtained through transformers and six-phase valve rectifiers. The antenna of the high-powered transmitter is of the sausage type supported on 820-ft. masts, but details of this transmitter are no doubt familiar by now to most of you.

The medium power transmitters employed on European services are those at Leaffield, GBL, GBY and GBZ, and GBV at Rugby. These took the place of the old GBL are transmitter, and the Northolt and Stonehaven transmitters, and are similar to each other in most respects. The operating frequencies are 43.2, 51.5 and 65.2 kc. w/1 6,950, 5,830 and 4,600. These transmitters employ 6 water-cooled valves in the last stage and deliver approximately 50 kw. to the aerial.

In recent years short wave working has developed very rapidly, and Fig. 1 shows one of the latest Post Office types of transmitter. Actually this is a telephone transmitter, but the telegraph transmitters follow similar lines except that the no speech-amplifying and modulating equipment is incorporated, nor is the final 60-kw. stage employed, the rating being 20 kw. Crystals control the transmitting frequency through the necessary frequency doubling and power amplifying stages to the final or output stage of two 10-kw. (water-cooled) valves in push pull.

Usually this type of transmitter is arranged to energise a directive antenna or array, which concentrates the emission of energy fairly sharply in a given direction.

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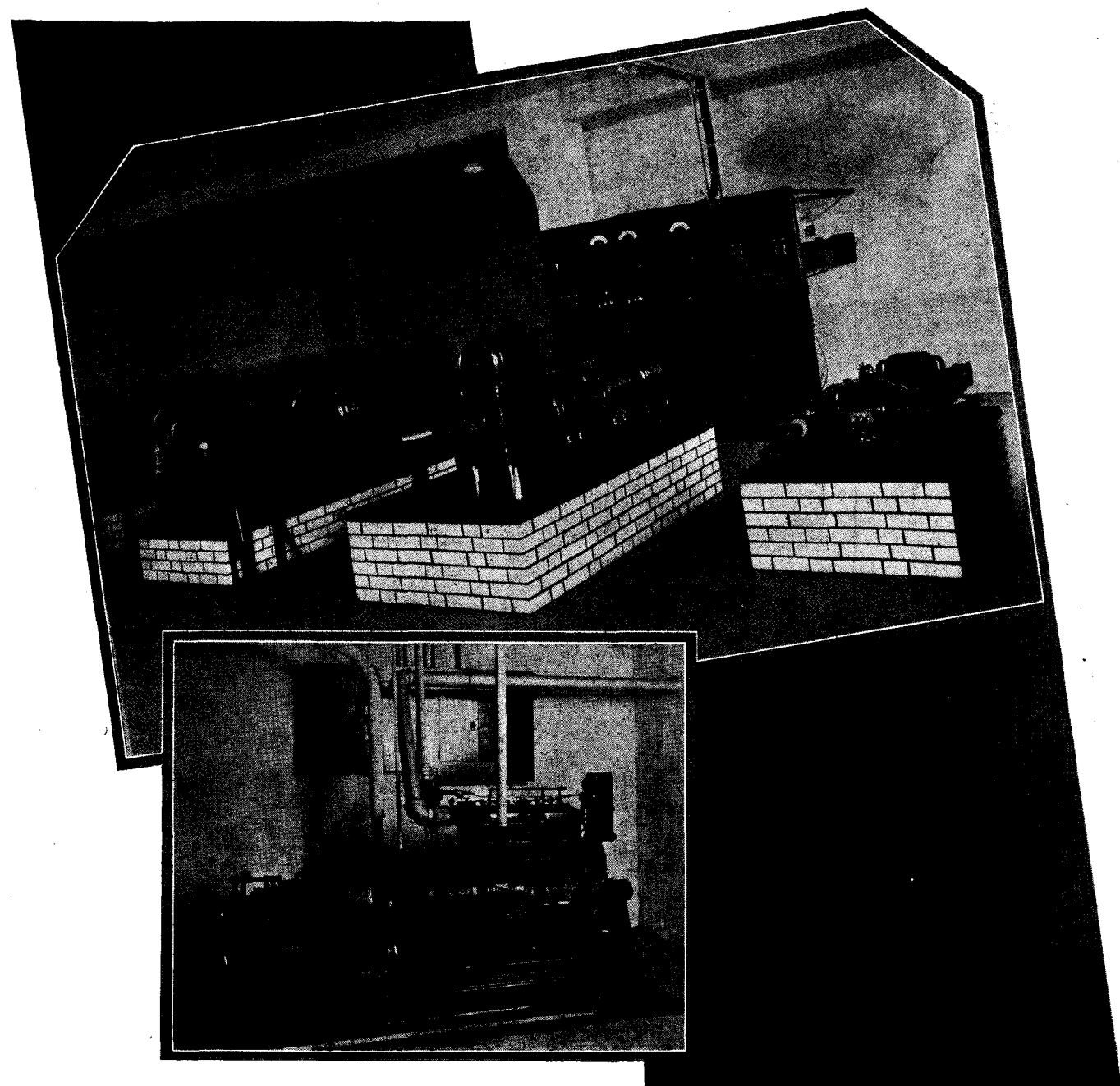
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BRANCHES AND AGENCIES THROUGHOUT THE WORLD.

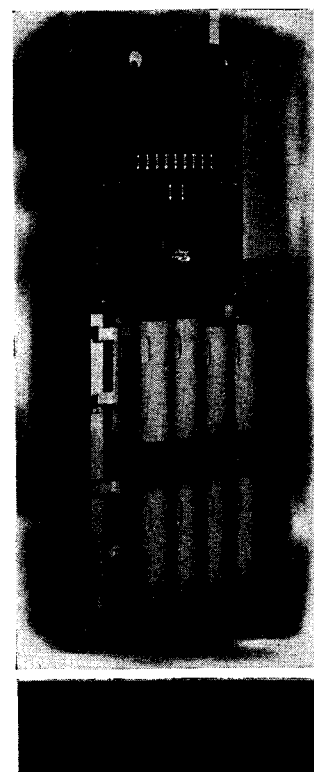
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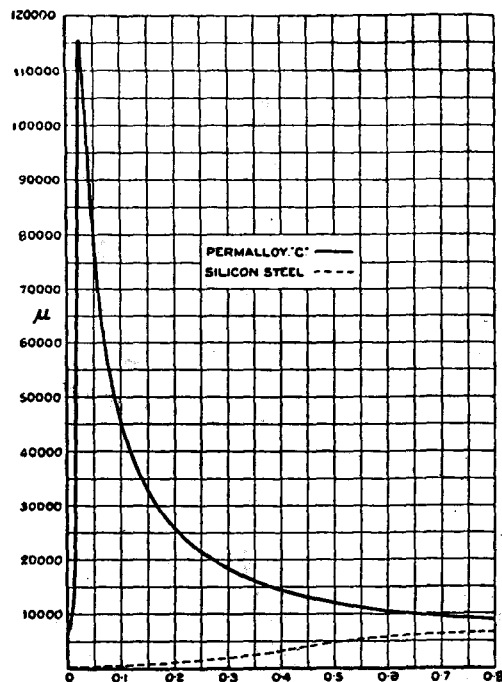
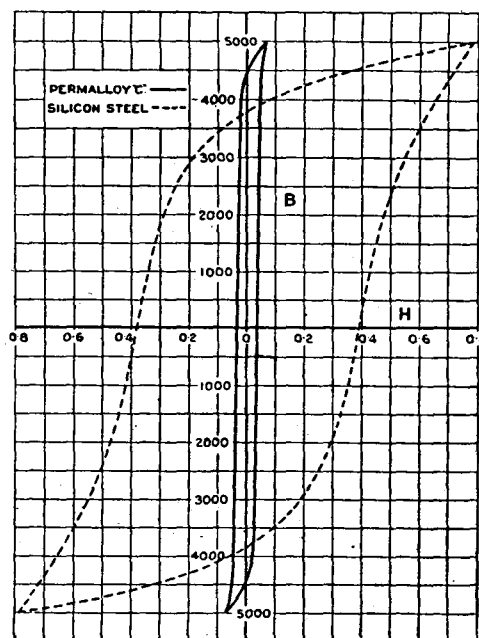
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These arrays generally consist of a number of dipoles (whose length is a function of the emitted wavelength) arranged in the form of a curtain and backed by another similar curtain at a given distance, depending on the wavelength. This second curtain is not directly energised, and acts as a reflector.

Fig. 2 shows a recent type of short-wave receiver constructed by the Post Office for telephone reception. Telegraph receivers under construction follow similar lines, and actually this receiver is suitable for telegraph reception. The main features are two H.F. stages in duplicate, detector, five intermediate frequency, heterodyne, &c. The number of valves incorporated in a receiver of this type is about 35.

Medium and long-wave receivers of the Marconi commercial pattern are installed at the St. Albans receiving station. These receivers cover wavelengths from about 2,500 up to 10,000 metres in the case of five, and 6,000 to 20,000 metres in the case of the remaining three. They are of the unit type with each unit carefully screened, and consist of aerial tuning unit, two stages H.F. filter, three stages H.F. tuned and neutrodyned amplification, heterodyne, anode bend rectifier, four stages L.F. filter and three stages L.F. amplification. Recording facilities are provided on all sets.

Two of the short-wave receivers at St Albans were designed and erected by the Marconi Company, who, it will be remembered, were the pioneers of the modern short-wave technique.

The Marconi beam transmitters, such as are now operated by the Imperial and International Communications Company for inter-imperial communications, should be mentioned as illustrating the development outside the Department. In this type of transmitter the transmitting frequency is kept constant by a special valve drive circuit, and the power is fed to the antenna through two amplifying stages associated with the drive circuit for either wavelength and a final output stage which may be used with either. The output stage incorporates two 10-kw. oil-cooled valves. A keying absorber panel completes the transmitter. The transmitter energises arrays of the Franklin type. These arrays are composed of transmitting and reflecting curtains of serial construction suspended between 250-ft. masts. Both transmitters and receivers in short-wave directive working usually operate in conjunction with large arrays such as this, the arrays being very similar in both cases. The type of short-wave receiver employed on the beam services is similar to that supplied by the company to St. Albans. The units composing this receiver are the feeder panels for the order of wavelengths employed, modulator, incoming s/w circuits and first heterodyne, first filter amplifier, first rectifier and second heterodyne, second filter amplifier additional filter, main rectifier and limiter and recorder circuits. The last panel is the control and testing panel.

That concludes the very brief, and, I am afraid, rather sketchy, survey of development in this country, which we hope will permit British development, both private and official, to be compared with that in the centres to which the following notes relate. These centres are Rome, Budapest, Bucarest, Warsaw, Prague and Berlin, and as time does not permit of us dealing in any way exhaustively with even these few centres, we have endeavoured to select a few representative points of interest in each case.

In Italy the point to point wireless services are operated by a company, the Societa Italo Radio, which originally operated three groups of stations—the Milan group, the Coltano group and the Rome group. These three groups have now been centralised on Rome with a transmitter group at Torre Nova, near Frascati, about 9 miles N.W. of the city, and a receiving station at Malnome, about 20 miles N.E. of the city. Unfortunately, during our visit this centralisation had only just commenced, and the then existing equipment consisted only of a typical alternator station—duplicate A.E.G. sets delivering about 400 kw. of energy with an 18-kw. medium wave Telefunken valve transmitter and a small 4-kw. valve set of Italo Radio construction. New transmitters now being concentrated on the original station include a 60-kw. medium wave transmitter employing Phillips W/c valves and two 40-kw. short-wave transmitters, all of Italo Radio construction. The short-wave sets employ crystal control units and follow normal practice.

A temporary short-wave array of the Chirex variety was erected at this station and supported between one of the 650-ft. masts and double wooden poles.

The associated receiving station is housed at Malnome, about 20 miles N.E. of Rome, and not far from the Rome-Pisa-Genoa railway line. The station is also in process of reorganisation and new equipment of more modern design is being provided, although it may prove necessary to remove the whole station on account of the electrification which is being talked about of a branch railway line passing near the station.

The late receiving station at Redeciesio, of the Milan Group, is typical of most of the stations visited. The receivers here were French, S.F.R. comprising aerial coupling circuits, heterodyne, 4 tuned stages of H.F. amplification (two units are provided, covering the complete medium and long-wave ranges), note filter, L.F. amplifier and rectifier and undulator unit.

Turning to Budapest, the wireless organisation is State operated, and includes transmitting stations at Szekesfehervar (the main station) and Czepele, the former about 20 miles S.W. of Budapest, and the latter on an island on the Danube just outside Budapest.

At Szekesfehervar two 450-ft. masts carry three antennae—two half-umbrella types and a centre roof-shaped portion. The earth system is an overhead distribution to earth mats.

One A.E.G. alternator of about 20 kw. and a telefunken 10-kw. valve set form the equipment of the station. The valve set is the typical Telefunken set of five years ago with master oscillator valve, amplifying and output stages, and rectifiers—all glass valves.

The Czepele station is of interest, not only as being an old and well-known station (HB of the old days) from which the present organisation has developed, but also on account of the Mannesman tube mast, formed of steel tubes with flattened ends bolted together—with which the station is equipped. This mast must be nearly unique.

At Czepele is also the first Hungarian broadcasting station, with a rather peculiar triangular aerial—centre fed. The $\frac{1}{2}$ -kw. transmitter is of local construction. This station has now been superseded by a much larger one of Telefunken type at Laki Hej, about 10 miles S.W. of Budapest. The building housing this transmitter is rather attractive, and is beautifully kept inside. Receiving is concentrated at the Tarnok receiving station. This has not yet been brought up to date, and the equipment is of various types. Three Marconi commercial receivers are, however, installed and two small Telefunken short wave receivers of recent pattern (H.F., det. and two note mag).

Turning to Bucarest, development here has not been very rapid, and the main transmitter building is at Herestrau, which houses two S.F.R. alternator sets of about 50 kw., transmitting wavelength 11,000 metres. These sets have been running for several years and seem to have given little trouble. No short wave transmitters are yet installed, but their provision is in contemplation. Two transmitters at this station are of passing interest,

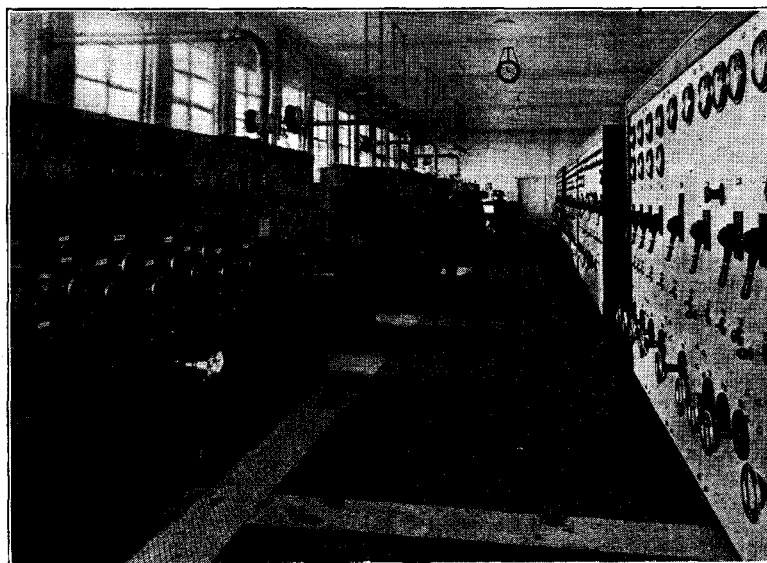


FIG. 3. NAUEN: INTERIOR OF TRANSRADIO CO.'S STATION.

installed on trains, and no doubt a relic of the war period. They consist of small valve sets of about 2 kw., but only occasional use is made of them, and then not as mobile units. Actually they comprise complete transmitting and receiving stations on three cars with a telescopic mast, batteries and charging and generating plant.

The associated receiving station is at Vacarest, about 6 miles away, on the other side of Bucarest. In addition to medium and long-wave sets, two simple experimental receivers for short waves are installed, but no up-to-date equipment has yet been provided.

The main transmitting station of the Polish administration is the Warsaw transatlantic station, which has ten 400-ft. masts arranged in line, each having 150-ft. cross arms. This is a R.C.A. station employing two Alexanderson alternators of 200 kw. It is of interest to note that the masts are riveted throughout, riveting being done aloft as erection proceeded.

The station itself is equipped with steam turbines and reserve Diesel engine equipment, but has fairly recently been connected with a public supply system from which energy is now drawn. On occasion difficulty is experienced with snow and sleet on the aerial causing mechanical overloading, and to obviate breakage special "weak links" have been fitted to each antennae wire support at each tower. Sleet melting equipment is also fitted as an additional safeguard. The method employed follows the standard R.C.A. practice of passing low frequency current through the aerial wires by means of special chokes which offer high impedance to high frequency but low impedance to low frequency A.C.

This station is in almost continuous operation, the alternators operating in turn, and seems to have given no trouble.

The receiving station for the Warsaw transatlantic transmitter is situated at Grodsk, about 20 miles S.W. of Warsaw, and is equipped with 5 R.C.A. medium and long-wave receivers. These receivers operate from a common Beverage antenna, but a large loop is also available. Additionally there are

several receivers of local construction for medium and short waves, one of which incorporates five tuned S.G. H.F. stages. Further short-wave equipment, both here and on the transmitting side, is projected.

The radio services of Czechoslovakia are also Government operated, the transmitting station being situated at Podebrady, an inland spa about 25 miles N.E. of Prague. Its main equipment is two 50-kw. alternators, but there are in addition a 4-kw. Telefunken valve set for medium-wave working, and two 20-kw. Telefunken S.W. transmitters of the latest type, which have just been installed. On account of liability to floods from the neighbouring river, and of the fact that much of the auxiliary alternator equipment is below main floor level, the building is made watertight for some distance above ground level. The alternator foundations are separate from the main flooring and carried down through the basement to lessen vibration. The Telefunken medium wave valve set has now been removed from its old position in an adjoining room to the right of this room, in order to accommodate the two new short-wave sets and machines. Sets of the same type as the latter will be described later. The antennae for the alternators and medium-wave set are suspended between the two masts, and consist of three "shed" types fed by a fan-shaped series of wires which then come down on either side of the triatic towards posts on the site boundary to which they are stayed.

The power supply was originally taken from public supply and then from large Diesel generator equipment, but the use of the latter has now been discarded for the public supply.

The associated receiving station is at Bila Hora, but contains no new features or up-to-date receiving equipment as yet. It was originally a monastery.

We turn now to equipment of some of the German stations, which represents some of the most advanced apparatus which we encountered.

The Koenigswusterhausen station, which is the main concentration of the German administration, operates on European services and is equipped with 18 transmitters in all. This includes one long-wave and one short wave broadcasting transmitters at Zeesen. The equipment of this transmitting station includes several types of transmitter, including Lorenz alternators, Telefunken valve sets, and, shortly to be added, two of the latest Telefunken short-wave sets. Perhaps the chief item of interest was a large mercury arc rectifier in a glass envelope, capable of passing 15 amps. at 12,000 volts. This was, however, not in operation on account of a failure of the envelope. Another of the Brown Boveri type in a steel casing is employed at Zeesen, handling 30 amps. at 12,000 v. for the medium-wave transmitter, and has been in operation for four years with practically no troubles.

The overseas services are conducted by the Transradio Co., Nauen being the transmitter concentration. The fine main building of this station is probably very familiar to many of you.

The main building houses the large 400 kw. alternators, two in number, together with two 130-kw. sets and a number of short wave sets. Additional short-wave sets working to the East and West are in separate buildings at either side of the main antenna.

The main alternator sets call for little comment except that the application of Baudot-Verdan on the long wave is being considered with the view to increase effective working speeds through difficult atmospheric conditions.

The latest type of short-wave transmitters has recently been installed for working to the Americas, Japan, &c., and a total of 12-20 kw. transmitters operating on various frequencies between 6,680 and 20,420 kc. (44.9 m. and 14.69 m.) is projected. Seven of these are completed and the remaining five under construction.

In the latest building the transmitters are arranged in pairs, in nests of four, as will be seen from Fig. 3, with transmitter control instruments, check undulator and slip puller between the sets, while directly opposite, on either side of the modulating and test panels, are the main power controls. The transmitters themselves are of unit construction, mounted on steel framework about 3 ft. high. They incorporate a crystal unit containing 6 crystals (temperature controlled) each crystal being capable of immediate selection by a rotating switch. The crystal stage employs a 10-watt valve, and is followed by a 30-watt amplifying stage, two doubler stages of 60 and 90 watts, using 30-watt valves in parallel, an optional doubler or amplifier of 1,500 watts, a 3 kw. amplifier and an output stage of two 10- or 20-kw. water-cooled valves in push-pull. Push-pull is only utilised in this last stage, the other doublers and amplifiers being neutrodyne. The final section is the feeder coupling panel. The normal wavelength range is from 15 to 60 m., but this can be extended to 100 m. Switch contacts are used for wave changing, with permanent contacts mounted on the coils. Power to the sets may be supplied either by machines and valve rectifiers or entirely from machines. In this case machines only are employed. H.T. plate supplies are at 1,500 volts for the doubling stages supplied from single commutator machines, 4,000 volts to the amplifiers from double commutator machines, and 10,000 volts obtained from four commutator machines to the output stage. An interesting feature of the machine room is that all machines are mounted on special anti-vibration mountings incorporated in the holding-down bolts.

Transmitting arrays fed by these sets are suspended between towers about 220 ft. high, and for waves of the order of 15 m. consist of two exactly similar arrangements of 48 horizontal dipoles (six vertical rows of 8 dipoles each), either of which may be used as antenna or reflector by altering transformer connections at the foot of the feeder lines.

Fig. 4 illustrates the latest type of Telefunken receiver for high speed telegraphy reception up to 300 words per minute. It is also suitable for telephony and the reception of picture transmission. The wave range is 10 to 41 metres, with four sets of interchangeable coils. This incorporates 4 stages of H.F. triode amplification, rectifier and heterodyne, five stages of intermediate frequency amplification (300 kc.) and rectifier, output stages and gain control. Either rectified double current or tone signals can be sent to line.

The receiver is of very solid construction, heavy screening boxes being fitted. Ease of access is a feature perhaps worthy of remark. The antenna feed is led to the coupling box at the top right hand side.

The new Transradio receiving station is now in process of erection at Beelitz, about 35 km. from Berlin. The receiving room will eventually accommodate 20 receivers in two rows.

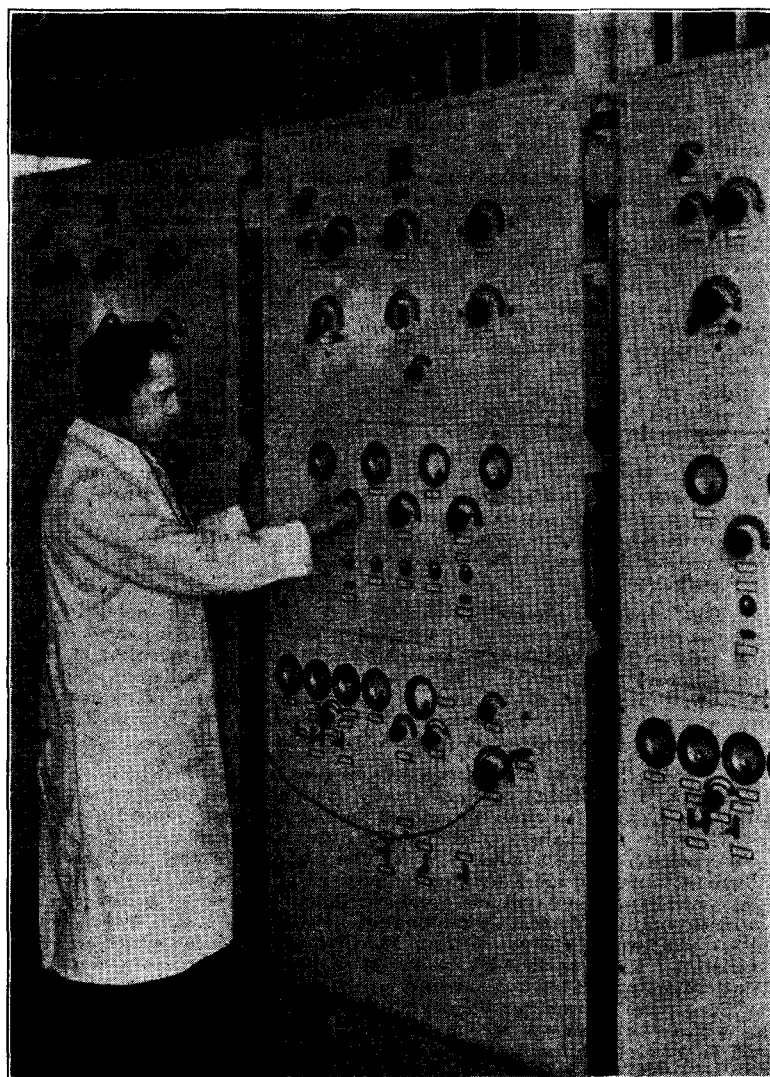


FIG. 4. TELEFUNKEN RECEIVER FOR HIGH-SPEED TELEGRAPHY.

The feeder lines from the receiving arrays are led under the floor to a central switchboard for coupling (under the floor again) to any receiver.

One of these receivers is fed entirely (except for grid batteries) from machines in an adjoining machine room, and it is intended to abandon battery supply, although a battery will be maintained to provide power in the event of main supply failure.

Antennae arrays are erected on the perimeter of the site on 220 ft. towers, and it is understood that four receivers can be worked if necessary from one array.

The traffic and control centre of the Transradio Company, which is in Berlin, is one of the most efficient and well planned central offices we have encountered, and includes 10 transmitter control points, together with the associated reception points, traffic circulation, service and accounts sections. The traffic is passed to and from the main telegraph office of the administration by pneumatic tubes, and careful check of all delays in this office is made by time stamping each message immediately it is received and at succeeding operations.

The transmitter control points are fitted with Creed perforators, transmitter, undulator and aural check of outgoing signals, hand key, and time stamp. The undulator slip is automatically time stamped each half minute, and an automatic recorder keeps account of the time the transmitter is in operation.

The receiving points are fitted with three typewriter positions, and are triple banked when necessary, each typewriter position being provided with a slip puller. The first operator passes sufficient slip to occupy the remaining operators and continues transcription until they are clear, when he again passes slip. Each operator thus has a batch of, say, 10 messages at a time. The messages are typed on printed forms, which are torn off the roll (carried on the typewriter) against the top edge of the carrier plate, and placed in the belt conveyor running down the middle of the table. This conveyor transfers them to other conveyors, which take the received messages to the abstracting tables for onward handling.

SOME DIFFICULTIES AND SOME POSSIBLE DEVELOPMENTS.

Many difficulties met with in point-to-point working are common to other telegraph communications, but one peculiar to wireless has been adverse atmospheric conditions. These frequently hamper traffic disposal on medium and long-wave services, but the addition of short-wave channels has very largely stabilised working. Wireless circuits for medium distances may now be established with a stability at least equal to line circuits. They possess, moreover, the advantages of more concentrated maintenance and less liability to interruption in stormy weather than long exposed line routes. In fact, during the severe storm of January last, which caused serious dislocation of many telegraph services, no failures at the Department's wireless stations were reported, although control line failures rendered several transmitters inoperative for a time.

It is usually possible with wireless channels to transfer them rapidly if required, as direct channels to points with which they normally do not work and also to operate a fork, or split service, or a multiple distribution service direct to widely distant points from a single transmitter. It is advantageous to retain this flexibility, particularly where emergency links, either home or foreign, require to be established from time to time. Directive short-wave working tends to make this a little more difficult, but the difficulty may generally be met by providing alternative omnidirectional antennae.

In developing services where the two terminals are under separate control high efficiency is sometimes not very easy of attainment as the working of the service is governed by that of the less efficient end. In a number of instances corresponding stations have been lacking in really satisfactory equipment or adequate skilled technical direction, with the consequence that reliable reports on operation and tests are not always forthcoming, making it difficult to perfect equipment.

One must also be prepared to study national characteristics in operators and operation and the difficulties under which co-operating stations may be working.

IN THE MATTER OF DEVELOPMENT.

There can be no question that, following the organisation of wireless services on the lines of transmitter groups and receiver (relay) groups with a central control or operating office as described earlier, the outstanding feature of recent years is the increased use of short wave. In the interests of stability it has been necessary to employ this not only for long distance services, but also for medium distance work. A year or two ago many countries were obviously holding back before installing short wave, and awaiting the results of pioneer work by countries such as our own, Holland, Germany, America and France. There is now a decided tendency for other countries to equip with short wave, especially since it has become clear that short-wave services, given proper design and equipment at both transmitting and receiving ends, can carry more traffic than medium waves, at any rate during the summer months, when medium-wave working is often difficult. There is also in many European countries a strong desire for direct American and transcontinental services, and short-wave equipment is capable of satisfying that at a far lower figure than the high power long-wave equipment previously necessary. It seems, therefore, that any considerable medium wave development is at least unlikely, especially having regard to the congestion in the medium-wave bands. It is more probable that European working will be carried to a greater extent on short waves, although, of course, the congestion question is almost equally serious in the favoured short-wave bands, and such working may not always be strictly in keeping with the C.C.I.R. (Hague) recommendations.

It will be interesting to see how far the advantages of direct communication, concentrated maintenance and the avoidance of transit charges will transfer traffic from lines to the aether, also whether these factors will result in, and technique will permit of, similar development in telephone working. It is an undoubted fact that very considerable increases in wireless message traffic handling have taken place in the last 10 years or so, as much as tenfold in some cases, and much of this cannot be new traffic.

Although finality has most certainly not been reached in wireless development, it would be idle to try and forecast any outstanding developments. At the same time, it may be that investigations which are proceeding in some centres into the activities of very short waves may give some relief to the serious congestion which seems probable in many of the wave bands if no early relief is forthcoming.

So far there has been no extensive application of direct printing telegraphs in wireless working, although trials take place from time to time.

Further and more important trials of the Baudot-Verdan system are apparently contemplated in the near future with the view to improve the working of French and German long-wave transmitters, but this system is perhaps rather slow for application to a good present-day wireless circuit. At the present time operating speeds on the wireless link are tending to outstrip the speeds at which transcription from the received slip (which is the commonest method of reception) can be readily effected, and a direct printing system would have undoubted advantages in many cases, especially if it did not seriously reduce working speeds and if it permitted of a reduction in the types of equipment to be maintained and with which operating staff must be acquainted.

In concluding, we would like to acknowledge our indebtedness to the kindness of the Marconi Company and the Transradio and Telefunken Companies of Berlin for several of the photographs which we have shown, and of which two are reproduced here.

CORRESPONDENCE.

TELEGRAPH EXCHANGES.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—The interesting letter of Mr. A. C. Booth in your September issue, published under the caption "An Early Teleprinter," raises a basic question. What, when and where, was the earliest electric telegraph exchange? This question is one of more than merely passing historical interest.

Is it not true that, prior to 1892, there were numerous Wheatstone A.B.C. telegraph exchanges in England and Scotland, and that, as a matter of fact, the earliest one of them, dating back to the year 1870, or earlier, was the historic Newcastle-on-Tyne A.B.C. exchange? It is my impression that the switching and intercommunication functions of those A.B.C. exchanges were identical as regards switching equipment and operation, with the functioning and equipment of the earlier Post Office Telephone Exchange switchboards, such as those established in centres like Limerick and Cork about 1883. The essential and main difference was that, in the old A.B.C. exchange systems, Wheatstone A.B.C. telegraph instruments were employed, and that Gower-Bell telephone instruments were used to replace them when the Post Office, in virtue of the legal decision that the telephone was a telegraph instrument, began to replace the A.B.C. by the telephone in the early nineties.

I do know, positively, that, in order to standardise methods for the conversion of existing A.B.C. exchanges and associated lines to telephonic operation, there was issued by the Engineer-in-Chief's Office in 1892, an "E" Circular, No. 130. This circular is of particular interest, for it shows that the old telegraph exchanges, to which I refer, embraced, not alone subscribers' intercommunications, but that they also provided for through switching of public telegraph connexions located on different wires, such offices not being ordinarily in direct communication, for the purpose of direct transmission of public telegrams between these telegraph offices. The circular I refer to clearly indicates the manner of connecting the lines, the jacks (then called switch springs), and the non-polarised (or polarised) indicator drops, and how the flexible cords and pegs were used in answering calls and ring-offs when establishing, or breaking, "through" A.B.C. exchange connexions.

The London Telegraph Intercommunication System, so admirably described in Mr. (now Sir Thomas) Purves' book, is, of course, a somewhat more recent development of the inter-public telegraph office exchange system (without the private subscriber feature), than the A.B.C. telegraph exchange which covered both facilities. This London system also ante-dates the Berlin one.

It does, therefore, seem that the quoted statement, from Adolphe Franke's speech of Dec. 15, 1903, would have been more correct had it been said that "the telegraph to some extent re-enters," rather than "enters," the domain hitherto (*sic*) confined to the telephone.

May I add a little to this lengthy letter, just to say that, I am open to, and solicitous of correction if, in any particular, my thus expressed views are incorrect, or at variance with fact.—Fraternally yours,

Engineering Department,

The Western Union Telegraph Co.,
60, Hudson Street, New York, N.Y.

Oct. 9, 1930.

P. T. MACNAMARA.

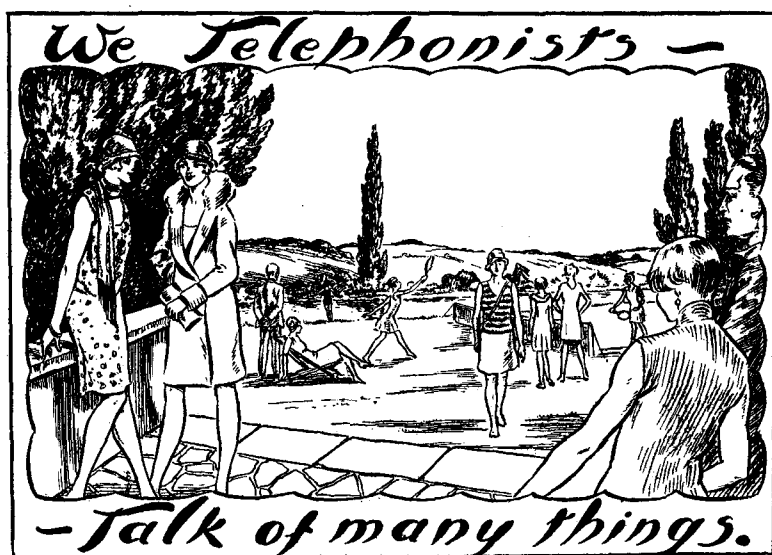
[The following information, abridged from Chap. II of Sir Thomas Purves' book, "Telegraph Switching Systems," throws some further light on the matter:—

The "Universal Private Telegraph Company's A.B.C. system (serving renters) was absorbed by the P.O. in 1870. Its largest transmitting centre was at Newcastle-on-Tyne—about 25 lines and instruments.

"Under the P.O. the system increased rapidly and in 1874 the space available became insufficient to provide the necessary terminal instruments. A through switching system was therefore devised which reduced the number of terminal instruments to 15—serving 60 public and private 'A.B.C.' circuits.

"Public office circuits and private wire renters circuits were switched through to each other as required. Similar systems, of similar capacity, were for several years in use at other places, including Glasgow, Sunderland, Middlesbrough and Swansea."—Ed., T. & T.J.]

(Other correspondence unavoidably held over.)



The Glorious Fifth.

COMETS with streaming tails of fire shoot across the vault of the night sky, the velvet blackness is lit with a quivering glow, meteoric and multi-coloured showers appear and disappear mysteriously, the customary silence of the evening is broken by bangs, roars, and crackles. These phenomena have no occult significance. They are not even mentioned in the sagacious pages of Old Moore. They are merely an indication that the annual and time-honoured Festival of Guy is being celebrated—the festival known to the youthful sacrificial enthusiasts as Guy Fawkes' Day and held on or about the 5th of November (which you are poetically entreated to "remember, remember, not forgetting the guy, guv'nor").

Mr. Fawkes—spelled variously Fox and Faux, but invariably pronounced Forks—had, it seems, a grouse against Parliament. In this he was curiously modern and is entitled to some measure of sympathy. But I regret to say that his methods of protest were not strictly constitutional. Instead of indicating his disapproval by means of the franchise or by parliamentary question, or even by the more aggressive method of "lobbying," he endeavoured to "blow the House of Parliament right up into the sky." Effective, of course, but drastic and rather crude, don't you think? He did not succeed owing to the interference of the Home Secretary who, it so happened, chose that day for a rehearsal of the since famous Arcos Raid. As a consequence "Felix goes on talking, goes on talking still." Hence youth continues to demonstrate its affection for and profound belief in the parliamentary system and its utter horror of the treasonable intent of Guy by burning him in effigy every year by the thousand. It is rather hard on Guy to penalise him because he foozled his drive. Had he succeeded he might possibly have been canonised in later years and candles would have been burned to his memory. But although he failed he triumphs, and he is canonised instead and roman candles light him to his "bonny." One feels, doesn't one, that one ought to be aware of the historical background of these ancient customs. I mean one feels that one can take a more vital interest in the proceedings and one is able to enjoy oneself much more intelligently—don't you think?

As to the festival itself there are a few fundamentals to be remembered. It should be made plain at the outset that they who are bidden to the feast must bring their own fawkes. Guys cannot be obtained from nor repaired at Guys Hospital. Further, guys should not be confused with Girl Guys (or is it Guides) who for some curious reason are never burned. All Guys are not guys. Some Guys are rather touchy on or about the glorious fifth and are liable to be consumed with wrath rather than by fire at the mere suggestion of coupling their name with the occasion. This, of course, is not according to plan and is apt to spoil the fun. Guys must be provided with coat, trousers and hat and care is essential in the selection of these items. While it is inadvisable to raid the wardrobe and the trouser-press, I cannot warn you too strongly against taking father's gardening suit. Of all family possessions this is the most precious. Any bridegroom will give you a top hat with his blessing. The body is usually stuffed with shavings, but if you ask a barber for them, don't blame me if you get scalped.

All that now remains to be considered is the fire. Bean-poles and pea-sticks will do excellently—if you can get them—and fences, trellis, and rustic arches will doubtless be involved in any case. Of course, if you can manage to include the summer-house, a really splendid result can be secured and one at which even the members of the local fire brigade, who are notoriously blasé, will be interested spectators.

The fireworks will follow.

PERCY FLAGE.

Dear Editress, Divine,
I saw your plaint in rhyme
In last month's *Journal* fine.
So straightway did compose
Enclosed original prose.
If it accepted be
"Renrut" the name for me.

A Day Spent at Victoria Exchange—Mar. 6, 1930.

Victoria Exchange I found to be a fine, airy, spacious exchange—it reminded me of a big ship on the land. Certainly it was the best exchange of all the many I have visited, and coming straight from the modern Welbeck automatic exchange, the contrast was even more marked. The difference in the size of the sitting-rooms and dining-rooms—Victoria so large and Welbeck so small—showed the great difference in the number of human staff employed at both exchanges.

During the morning I listened in to the multi-coin boxes circuit. The Telephonist I listened in to impressed me very much with the wonderful dexterity and tact with which she managed the calls, as this section of the public seems to be by far the most trying and ignorant of all the many classes of telephone users. The multi-coin box opal, when lit up, reminded me, with its grey marking round the red opal, of the eye of the water-fowl we sometimes see in the parks. Listening in on this class of call I found extremely interesting and certainly amusing, the remarks of the multi-coin box users sometimes being so very quaint in their ignorance of telephony. The telephonist of this section of telephony uses initiative very largely.

"Press Button B, and regain your money"—the refrain seemed ever to go on, in the charming voice of the telephonist so certain of her all-round knowledge of her work. A wonderful telephonist discharging her many duties in such a delightful way. RENRUT.

London Telephonists' Society.

On Friday last, October 10—how swiftly "Tempus" trickles—the Session started once again, the Speaker, F. B. Nichols. "Why are we here?" he asked, and then explained to us the reason; and most of us agreed with him—though others thought it treason. His "Omar" misquotation set imagination winging, "A Loaf, a Book of Verse, some Wine, and Thou beside me ringing." One speaker said that Omar and Diogenes united were somewhat strange—we grant him this but would be most delighted if he would tell us which was which (each was a very rare man) e.g., who was Diogenes, the President or Chairman.

Speech followed speech, as one by one each speaker seemed to "rush on"; until the Chairman intervened, ending the long discussion. And then the President replied (his audience listened raptly) dealing with each "complaint" in turn, crisply, concisely, aptly; and as in terse and telling phrase he reached his sage conclusion, he brought to friends exceeding joy, to critics vast confusion.

Next month, to wit, November 7, with Strowger we'll be touring. So don't forget to mark the date—you'll find him *most* alluring.

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

WESTERN DISTRICT NOTES.

In the August issue of the *T. & T. Journal* reference was made to a fete held in aid of the Plymouth Postal Scholarship Scheme. This scheme, which now includes the whole of the Western District, has for its object the sending of at least one student every year to the University College of the South-West, at Exeter. The hon. secretary of the movement has recently received a letter from the Assistant Postmaster-General, which will no doubt be of interest. It reads as follows:—

"Dear Mr. Horwill,—I was very pleased indeed to meet you during my recent visit to Plymouth and to hear from you of the scheme which has been inaugurated by your committee for the establishment of Post Office Scholarships for entry to the University of the South-West of England. It is a scheme that must surely commend itself to the generosity and foresight of all postal workers in the South-West. To the young it should make an especial appeal, for it is they who will probably be the parents of the boys and girls who will win the scholarships. But for such a noble ideal as paving the way for the boy or girl of capacity and ability, but inadequate means, to enter the University for a wider training, I believe that all sections and all ages will be ready and willing to put up their penny per week. The circumstances surrounding the winner of your first scholarship must fill your committee with pride and joy—joy in the knowledge that such a scheme was started in sufficient time to enable one in such humble circumstances, yet of such sterling merit, to advance to a wider field of learning and so by acquiring knowledge, to win distinction and render still more valuable service to the community. I speak of pride and joy for your committee, but it surely cannot stop there; for it must bring a measure of such pride and joy to all the postal workers in the South-West. Perhaps I am too optimistic in

taking it for granted that all the postal workers are contributing; I hope I am not. There is no section who can be indifferent to the scheme without sooner or later regretting their indifference. The scheme is a pioneer one and I have not the least doubt in my mind that it will be copied by other districts. I shall watch the growth of the scheme with interest and you and your committee may rest assured of the good wishes of—Yours sincerely,

S. P. VIANI."

We are all accustomed to the irate subscriber who threatens all sorts of violence and methods of revenge over the telephone, which usually ends in words, or "smoke," so to speak, but it is not often that the threats take a practical form.

A case recently occurred in the West Country where a certain person called at an exchange in rather a lonely part and said he wanted to telephone. There was, however, no call office at the exchange and he was directed to the local post office, a short distance off. On this he became angry and used foul language and thrust his fist into the attendant's face and threatened to knock her down. In the afternoon he again appeared, but was stopped by a gentleman. In the evening he returned and nearly knocked the door down with a stick; he was again prevented from entering. The next day he once more came, but was prevented from entering the exchange. Later this charming person, when on his defence in court, stated he simply called to tell her (the exchange attendant) about her fowls coming into his field and destroying the crops, &c.

The bench, however, had other views and dealt with him accordingly.

A tale is going about that at some amateur theatricals which were held not a 100 miles from Exeter one of the actresses, who was a telephonist, in the course of her part at some dramatic moment was required to scream "Oh! Oh! do save me." True to her excellent training she subconsciously screamed "Double-oh, do save me."

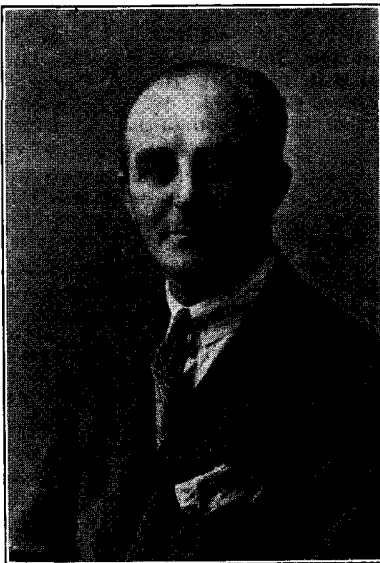
At the opening of a rural automatic exchange recently some difficulty was experienced with one of the subscribers, who was apparently an elderly lady. She was asked if she would kindly give her telephone number to check whether the right circuit had been connected. After considerable difficulty she slowly called out the figures of the patent number on the finger stop of the dial.

The Western District has recently had the honour of being appointed a training centre for Assistant Traffic Superintendents, and has commenced operations with the training of two candidates who passed the last examination.

Mr. S. C. S. Lewis, Assistant Traffic Superintendent from the London Telephone Service, took up duty in the Western District recently, vice Mr. E. B. M. Lord, promoted to Glasgow. F. J. F.

GLASGOW TELEPHONE NOTES.

THIS month we have to record the departure of Mr. R. W. Trenwith, who has been promoted to Higher Clerical Officer at Edinburgh. The occasion was marked by an interesting function held in the District Manager's



MR. R. W. TRENWITH.

Office on Oct. 9, when Mr. Trenwith was presented by the staff of the District Office with a gramophone (H.M.V.) as a token of their esteem and good wishes for success in his new sphere.

In making the presentation, Mr. Coombs, District Manager, congratulated Mr. Trenwith on his promotion, and in the course of a brief and felicitous speech he stated that the regret at the loss of Mr. Trenwith was tempered only by the knowledge of the circumstances necessitating his removal. To Mr. Trenwith he conveyed the best wishes of the staff and expressed the hope that Mr. Trenwith's work would be further recognised in the future.

Mr. Law, Staff Officer, and Mr. Wright, Clerical Officer, also spoke. Mr. Trenwith suitably replied.

In notifying us of the entertainments that have been arranged by the Glasgow Post Office War Hospitals' Entertainment Committee for the ensuing winter, the Secretary, Mr. T. S. Ward, reports a very satisfactory year's work for 1929-1930. One pleasing feature is the increase in donations. The total income for the 12 months just ended is £162 15s. 9½d., of which £118 7s. 8d. has been contributed by the staff of the telephone branch. The following is a specimen of the letters of appreciation on behalf of the wounded soldiers:—

"The patients wish me to thank you and the members of your association for the most enjoyable outing you gave yesterday. When we remember your generous interest in winter as well as summer we are grateful to you all for your sacrifice of time as well as money. The friendly spirit you manifest has a value beyond the mere enjoyment provided and will be remembered by all who have experienced it."

(Sgd.) "MED. SUPT., BELLAHOUSTON."

We extend a hearty welcome to Glasgow to Mr. T. Frankland and Mr. J. Reid, who commenced training as Assistant Traffic Superintendents on Sept. 30. They may be assured that every opportunity will be taken to make their stay both profitable and happy.

We also welcome Mr. J. C. Dalziel, Higher Clerical Officer, from Edinburgh. Mr. Dalziel is glad to be home again in Glasgow after a succession of transfers in the short period of 14 months.

A Day with Pepys.—Thursday: Thursday is a proper day on which to disbelieve everything that flatterers tell you. Up before 4 o'clock which is the hour I intend, now to rise at, and to my office a while, and with great pleasure I fell to my business. Then I full of thoughts and trouble touching the issue of this day; and to comfort myself did go to the Dog and drink half a pint of mulled sack, and in the Hall (Westminster) did drink a dram of brandy; and with the warmth of this did find myself in better order as to courage, truly. I do plainly see that I am not a man able to go through trouble, as other men, but that I should be a miserable man if I should meet with adversity, which God keep me from. So we all up to the lobby; and between eleven and twelve o'clock, were called in, with the mace before us, into the House, where a mighty full House; and we stood at the bar, namely, Brouncker, Sir J. Minnes, Sir T. Harvey and myself, W. Pen being in the House as a Member. The whole House was full of expectation of our defence what it would be, and with great prejudice. After the Speaker had told us the dissatisfaction of the House, and read the Report of the Committee, I began our defence most acceptably and smoothly, and continued at it without any hesitation or losse, but with full scope, and all my reason free about me, as if it had been at my own table, from that time till past three in the afternoon; and so ended, without any interruption from the Speaker; but we withdrew. And there all the world that was within hearing did congratulate me, and cry up my speech as the best thing they ever heard; and my Fellow Officers overjoyed in it. It is plain we have got ground; and everybody says I have got the most honour that any could have opportunity of getting; and so with our hearts mightily overjoyed at this success, we all to dinner. Then to Sir W. Coventry's chamber, where the first word he said to me was "Good-day Mr. Pepys, that must be Speaker of the Parliament House"; and did protest I had got honour for ever in Parliament. He said that his brother, that sat by him, admires me; and another gentleman said that I could not get less than £1,000 a year if I would put on a gown and plead at the Chancery-bar; but, what pleases me most, he tells me that the Solicitor-General did protest that he thought I spoke the best of any man in England. I then to the Duke's lodgings; and, as soon as he saw me, he told me with great satisfaction, that I had converted a great many, and did, with great praise of me, go on with the discourse with me. Then did meet the King who said "Mr. Pepys, I am very glad of your success"; and fell to talk of my well speaking. My Lord Barkeley did cry me up for what they had of it; and others, Parliament-men, did say they never heard such a speech in their lives delivered in that manner. Progrers, of the Bedchamber swore to me that he did tell the King that he thought I might teach the Solicitor-General. Everybody that saw me almost come to me with such eugolys, as cannot be expressed. Mr. G. Montagu kissed me; protesting that I was another Cicero. Mr. Sands said he would go 20 miles to hear the like again, and that he never saw so many sit four hours together to hear any man in his life, as there did to hear me. Sir John Duncomb do say that the kingdom will ring of my abilities. Mr. Vaughan did protest that he had sat 26 years in Parliament and never heard such a speech before: for which the Lord God make me thankful! and that I make use of it not to pride and vain-glory, but that, now I have this esteem, I may do nothing that may lessen it. . . . Thence home; and there with great pleasure, with my wife talking over my great success, and playing at cards a little—she, and I, and W. Hewer, and Deb., and so, after a little supper, I to bed.

BIRMINGHAM NOTES.

Presentation to Mr. W. H. Oliver.—Mr. Oliver, who left us on Saturday, Sept. 13 last, to take up his new position as Higher Clerical Officer in the Brighton District, was presented by the staff with a gold watch.

Mr. Piggott (Traffic Superintendent), in making the presentation, expressed the sentiments of the whole of the staff when he congratulated Mr. Oliver upon his well-deserved promotion.

Accounts Section.—The first of a series of meetings which have been arranged for the Accounts Section was held on the evening of Sept. 19 last, when a most interesting paper was given by Mr. W. King, Clerical Officer, on the work in connexion with advice notes. His audience included interested members of the Traffic and Contract Sections.

The District Manager (Mr. J. L. Parry) presided, and in opening the proceedings explained that the object aimed at was to familiarise the staff with the work in the various sections.

It was evident, from the interest which was displayed, that these meetings will be appreciated, and the knowledge which the staff will gain from them will be invaluable.

Visit to the General Electric Company's Telephone Works, Coventry.—By the courtesy of the General Electric Co. the District Manager, Mr. J. L. Parry, and members of the Birmingham Traffic Staff, visited the company's works at Coventry on Oct. 9 last, to see the telephone plant in process of manufacture.

Under the able guidance of members of the staff of the General Electric Co., a tour of the offices and various factories was made.

The visit was keenly appreciated, and thanks are due to the officials of the company for their kindness in affording facilities for the visit, and for their hospitality in providing the party with an excellent lunch and tea.

Birmingham Telephone Society.—The inaugural meeting of the above society was held on Oct. 15 last, when an introductory paper on the Birmingham Automatic Scheme was given by the District Manager (Mr. J. L. Parry) under the chairmanship of Lt.-Col. Brain (Postmaster-Surveyor).

The Chairman, in a most genial manner, congratulated the society upon a wonderfully successful meeting. The attendance, which numbered over 500, being easily the largest number of telephone staff that has been present at any previous function in the district.

Mr. Parry's paper, which was illustrated by lantern slides, gave a brief survey of the telephone system since its inception, up to, and including, a complete outline of the Birmingham Automatic Scheme. The paper was couched in language and terms which everyone present could understand, and every word of it was followed by the whole of the audience with the closest interest.

After the usual discussion the gathering was entertained by an excellent concert party, comprised of members of the Trunk Exchange and organised by Miss Vitty, and the evening was concluded by a little dancing.

Col. Brain is held in high esteem by the Birmingham telephone staff, and this was evidenced by the whole-hearted manner in which the vote of thanks to him was acclaimed.

The next meeting has been arranged for Thursday, Nov. 13, when a paper will be given by Mr. L. G. Allen.

LEEDS DISTRICT NOTES.

THE success which attended last winter's efforts has emboldened the Discussion and Social Circle to embark on a more ambitious programme for the coming winter. A strong committee drawn from all departments of the telephone service has been formed, under the chairmanship of Mr. J. F. Murray (Traffic Superintendent), and the first Staff Dance, which is to be held at the Metropole Hotel, Leeds, on Nov. 1, promises to give a splendid send-off to the social season.

Visits to Exchanges.—A scrutiny of the list of visits which have been paid to exchanges in the District indicates a widespread interest in the workings of the machine which must ultimately prove beneficial to the development of the service. Apart from the visits of individual subscribers, no fewer than 56 parties from societies, institutions and schools, totalling 1,157 individuals, have been initiated by the Traffic and Exchange staffs into the mysteries of the telephone system during the past 12 months. One of the parties was from a local golf club, and we have no doubt they found it equally as interesting as the 19th hole. Very many of the visits have been in the evening, and have called for a sacrifice of much personal time, willingly given, by the officers conducting the parties. The flow of questions at these visits is usually so incessant that the conducting officer of one party can be forgiven if the naive question of one little fellow attached to a school party was received with a certain measure of relief. The party was paying an evening visit to Leeds Exchange, and at about 8 p.m. the conductor, on asking if there were any more questions, received the reply from the smallest member of the party: "Please, Sir, can I go home now, as I have to be in bed at half-past eight?"

From Ilkley Moor!—There is a touch of the spirit of the eternal "War of the Roses" in the following open letter to the Liverpudlians which we have received from Miss Benson, the officer in charge of the Ilkley Exchange:

"Dear Liverpool,—In your notes last month, with a degree of pride, you recorded your experiences of unusual enquiries. You were delighted at the faith in you of your fellow Lancastrians. All to the good; but you do not stand alone. Come into Yorkshire—as an excellent jumping-off ground select that part of it where they walk on the moors 'baht 'at'—and the 'Tykes' will show you.

"What, for example, do you think of these?

- "1. 'I want a lady in — (a township 10 miles away). She is a widow, and lives with her father, who runs a Ford car.'
- "2. (In great desperation) 'Exchange, do tell me if you think three yards of 54-in. material are sufficient for a dress?'
- "3. 'Is Mr. —, whose number is —, the Mr. — who plays golf?'
- "4. 'Will you tell me at what theatre the "Co-optimists" are appearing this week? (They were 16 miles away.)'
- "5. 'I want to take my children to the travelling circus, please direct me to the field.'

"In every instance the enquiries were answered to the trusting ones' satisfaction.

"However, it is very probable that there are many exchanges which could be at us both. Shall we 'wait and see?'—Fraternally, "LS/IK."

A Bradford Episode.—Call office kiosks, it appears, are still a source of wonderment to some members of the public. The other day, in Bradford, an old lady, wearing a very anxious expression, was seen repeatedly knocking at the door of an empty kiosk. When, after witnessing this performance for a few minutes, a passer-by ventured to enquire the reason, it transpired that the old lady was under the impression the telephone operator occupied the kiosk and would "answer" in due course.

Bradford Swimming Club.—A very successful season was brought to a close when the Bradford Telephonists' Swimming Club held a gala night on Friday, Oct. 4. Each member was allowed to invite a friend, and judging from the large attendance the invitation had been well responded to. The "Bathing Belles" are already looking forward to the re-opening of the club next spring.

Leeds Winter Swimming Club.—The proposal to run a Mixed Bathing Club at the Cookridge Street Baths, Leeds, met with a splendid response, about 50 members attending on the opening night, Friday, Oct. 10.

Obituary.—The sincere sympathy of his friends in the North-Eastern Engineering District and in other departments of the Post Office is tendered to Mr. E. H. Farrand, who retired in December, 1924, from the position of Sectional Engineer, Leeds External Section, in the recent sad loss of his younger son Geoffrey, as a result of injuries received in a motor accident. The condolences also extend to Mrs. Farrand. Mr. Geoffrey Farrand was employed in the Leeds External Section of the Engineering Department.

GLOUCESTER NOTES.

Marriage.

Tarplee—Holder.—On Sept. 20, at St. Stephen's Church, Sidney Tarplee, Contract Officer, to Ada Elizabeth Holder, Clerical Officer, both of the District Manager's Office, Gloucester. We are particularly pleased to make the above announcement, because both of the contracting parties are members of the staff.

A few days prior to the ceremony announced above a very pleasant function was held in the District Manager's Office when, in the presence of a large gathering of the staff, Miss Holder and Mr. Tarplee were presented with an oak dining table, for which every member of the staff had subscribed.

Mr. Storrie, the District Manager, before making the presentation, referred to the excellent service rendered by Miss Holder to the department over a period of 13 years. Mr. Tarplee, he said, had, by his enlistment in the Army before he was 15 years of age, demonstrated that he possessed the courage which was an essential qualification for success as a Contract Officer. He wished them good health and every happiness in the future and asked them to accept the wedding present with the good wishes of all the staff.

Mr. Brodie, Contract Manager, and Mr. Jack voiced the felicitations of the staffs of the Contract and Accounts Sections respectively.

Mr. Tarplee returned thanks for the good wishes and the present, both of which, he assured the company, were highly valued by Miss Holder and himself. Miss Holder, although quite obviously overcome by the occasion, briefly expressed her personal thanks to all.

Miss Holder will be greatly missed for, besides being an efficient servant of the Department, she also was actively associated with matters affecting the welfare of the staff. For many years she had been the Assistant Secretary and Treasurer of the Local Branch of the C.S.C.A., and for her services in this capacity she had received a personal expression of thanks from the General Secretary, Mr. W. J. Brown, M.P., as well as the thanks of the local branch members.

L.T.S. SWIMMING GALA.

THE annual Swimming Gala of the London Telephone Service Amateur Swimming Association is an event at which the onlooker has difficulty to decide whether he enjoys most the excellent swimming of the competitors or the refreshing enthusiasm of the onlookers. It is quite an experience to hear the exciting cheers (mostly from feminine throats) in the packed hall, as the partizans of the various exchanges urge their representatives to victory. The "voice with the smile," of which one has heard so much, becomes the "voice with the yell." The Twelfth Annual Gala, held at Pitfield Street Baths on Oct. 10, was no exception to the rule, and it must be gratifying to Mr. E. A. Pounds, the founder of the Association, to see the dimensions to which his protégé has grown. Some twelve years ago the Regent Exchange



POUNDS CHALLENGE CUP WINNERS.

Regent Team: Miss Asgill, Miss House, Miss Palmer, Miss Tyler.

[Photo by Wykeham Studios Ltd., Streatham.]

entered the Business Houses Swimming Competition as the representative of the General Post Office, and the good show they made gave Mr. Pounds the idea of forming an association of the swimming clubs of the various exchanges. Commencing with four to five hundred members, the association now numbers about 1,600, and 38 clubs are affiliated to it, a striking testimony to his energy and enthusiasm.

Over 150 competitors took part in the recent gala, it being necessary to swim off the preliminary heats at 5.30, long before the admittance of the spectators. The principal results were as follow:—

Pounds Challenge Cup (Team Races).

- (1) Regent Exchange (Misses House, Palmer, Asgill and Tyler). 1 min. 41 sec.
- (2) Gerrard Exchange (Misses Burt, Ormond, Farey and Golborne). 1 min. 41.2 sec.
- (3) Trunk Exchange (Misses McBirney, Theakston, Westbrook and Ambrose). 1 min. 46.1 sec.

22 exchange teams took part.

Open Handicap. (33½ yds., for special prize given by the Controller, Mr. W. H. U. Napier.)

- 1st.—Miss Hunt (Museum).
- 2nd.—„ Butler (Tandem).
- 3rd.—„ Calman (Primrose).

Learners' Race. (Agnes Cox Cup.)

- 1st.—Miss Gittens (Mountview).
- 2nd.—„ F. Brown (Paddington).
- 3rd.—„ Whittle (Chancery).

L.T.S. Breaststroke Championship. (66½ yds.)

- 1st.—Miss House (Regent). 58 sec.
- 2nd.—„ McBirney (Trunk). 61 sec.
- 3rd.—„ Palmer (Regent). 63 sec.

Men's Team Race. (Prosser Cup.)

- 1st.—T/EDE (Messrs. G. Frier, H. A. Penn, F. E. Bishop and L. E. Cohen).
- 2nd.—T/EDN (Messrs. R. J. Niles, H. E. Bigmore, H. G. T. Adams and W. W. Armstrong).
- 3rd.—T/EDW (Messrs. R. W. Gregory, J. L. Booker, J. Walsh and J. Hodgson).

Sealed Handicap.

- 1st.—Central.
- 2nd.—Kensington.

Traffic Officers' Race. (Lotus Shield.)

- 1st.—Traffic.
- 2nd.—Accounts.

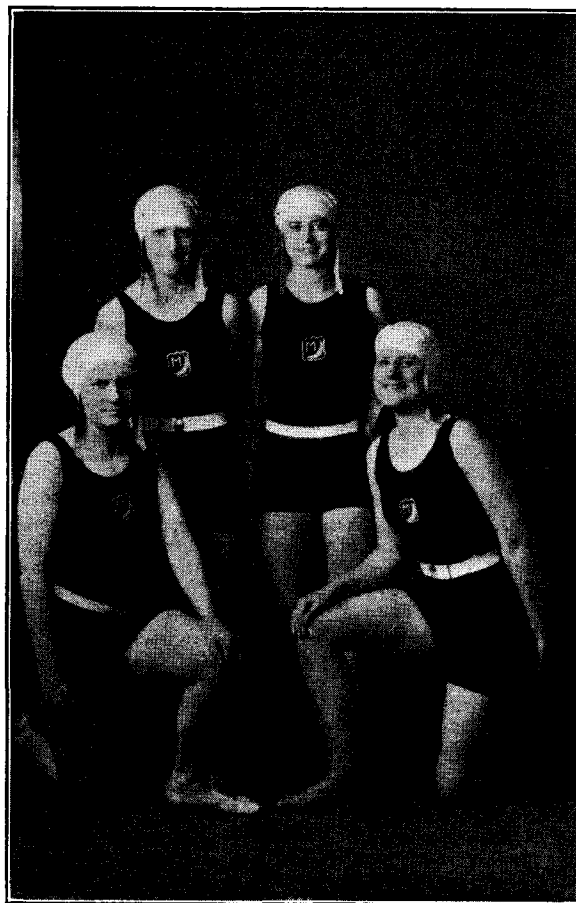
Men's Invitation Race.

- Banks. 68.3 sec.
- Insurance. 72.3 sec.

Supervisors' Championship.

- Miss Campbell (Kens.), 1; Miss Lloyd (Bishopsgate), 2; Miss McNeo (Avenue), 3.

Amongst the other events of the evening were an amusing and instructive demonstration of life saving methods by the Museum Exchange (Misses Osborne, Pilbeam, Wade and Carter), the winners of the L.T.S. Life Saving Competition. There was also a Water Polo Match in which the Insurance Office A.S.A beat



MUSEUM EXCHANGE TEAM.

Winners L.T.S. Life Saving Championship.

Miss Osborne. Miss Pilbeam. Miss Wade. Miss Carter.

London Banks A.S.A. by 6 goals to 1. Mr. Temme, the England player and Channel swimmer played for the Insurance Offices. Finally a long and interesting programme was concluded by a display of high and ornamental diving by Mr. W. G. T. Bourne, Mr. C. D. Tomaline and Miss Doris Grimes. A word of hearty praise must be accorded to the hard-working committee, judges and starters, and to Miss N. Temme, the Hon. Secretary, for the general excellence of the arrangements.

W. H. G.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of September resulted in a net gain of 1,285 stations.

Exhibitions.—There were 102 exhibitors at the Fashions Fair held at Olympia from Sept. 1 to Sept. 12, and 68 lines were provided.

At the Wireless Exhibition, which extended from Sept 19 to Sept 27, 131 lines were fitted, as against 118 last year, when the number of exhibitors was higher.

The Building Trades Exhibition took place between Sept. 17 and Oct. 1, and out of 321 exhibitors 155 lines were provided, as compared with 354 exhibitors and 144 lines last year.

Call Offices.—The demand for telephone facilities in public places must inevitably increase to a much greater extent than is the case to-day. An indication that this is taking place is noticeable at Waterloo Station, on the Southern Railway, where a group of eight additional call offices has just been installed, making a total of 22 in that station.

Kiosks.—There are now more than 2,000 kiosks in the London Telephone area.

Transfers.—Mr. P. Davey, Clerical Officer of the South-East Contract Office, has been transferred to a similar position in the Ministry of Transport.

A Contract Officer's Resource.—A novel method of canvassing has been initiated with success by a contract officer operating in a North-West London suburb.

When reporting to headquarters from a kiosk he noticed a lady waiting outside whiling away the time by counting out an appreciable number of pennies in readiness, so it seemed, to make a number of calls.

The contract officer immediately abandoned his call to Headquarters, opened the kiosk door and, by way of introduction, apologised to the lady for keeping her waiting. With hat in hand (and agreement in pocket) the contract officer addressed the lady.

"Madam, it appears that you have considerable need of a telephone, and that you have not got one installed in your house. I am a representative of the London Telephone Service. May I be of service to you?"

A conversation followed in which the many advantages of possessing a telephone were indelibly impressed on the mind of the prospective subscriber. Eventually the lady invited the contract officer to her house nearby and he came away with not only an agreement duly completed but with the lady's cheque as well.

London Telephone Service Sports Association.

Presentation of Trophies by Sir Henry Bunbury.—An enthusiastic audience of several hundred members of the London Telephone Service welcomed Sir Henry Bunbury at Cornwall House, on Friday, Oct. 17, at the distribution of trophies competed for during the summer season.

Mr. W. H. U. Napier, Controller, took the chair, and congratulated the telephone staff on their progress in the world of sport, instancing the successful athletic meeting at Chiswick in July, the recent formation of a Badminton Club, and of Hockey Clubs to the total of six.

Sir Henry Bunbury (guided by Mr. Hugh Williams, Secretary) then proceeded to hand over the trophies to the individual winners and the captains of the various teams. The Agnes Cox Cup for Tennis Team competition went to AR7, Accounts Branch (Miss Gardner, captain), Clerkenwell Exchange (who were the winners last year) being the runners up. The Pink Cup for individual contests was won by Miss Parker, who was semi-finalist last year, Miss Wilson (last year's winner) being this year's runner-up. The Prosser Cup for swimming was carried off by Mr. R. W. Gregory, of the Traffic Designs section, who also, as Captain of the Traffic team, received the Lotos Shield for inter-branch competition.

Sir Henry Bunbury, speaking after the presentation, said that work is not the only thing in life, and anyone who says that games interfere with work is talking nonsense. Although we have automatic telephony, we have not yet reached the stage of automatic athletics and automatic prizewinners. Individual human effort is still required for prowess in sport. One of the charms of the telephone service is its perennial youth. The service is still young, still growing up from infancy—getting better and better every day. "Keep on with your sport, with your comradeship and good fellowship, and may everything good attend you."

Mr. Pink, Deputy Controller, proposed a vote of thanks to Sir Henry, which Miss Agnes Cox seconded. Mr. Tinniswood, Assistant Controller, in thanking the Chairman for his presence, said how pleased he was to see this general interest of the staff in sport.

The presentation of prizes was followed by a very well rendered concert, in which the most appreciated artistes were the L.T.S. Quartette (Miss Pidgeon and Miss Knight, Messrs. A. Brough and Hugh Williams) and Miss Matlock (Gold Medalist, Romford). Many other performers kindly assisted in an excellent programme, a note of comedy being introduced by Miss Sim, Sloane, in a step dance. Mr. Tinniswood proved himself a very popular announcer.

Cricket (Contract Branch).—It must be rare for notes on a cricket match to appear in the Journal at this period of the year, nevertheless I believe that had it not been for the fact that no club was prepared any longer to allow their ground to be used for cricket matches that we should still be engaged recording the struggles between the Accounts Branch and the Contract Branch for possession of the Cricket Shield. A few weeks ago another attempt was made to settle this feud, with the usual indefinite result, the scores at the close being: Contract Branch, 154 for 8 wickets; Accounts Branch, 69 for 7 wickets. For the Contract Branch, Goodger knocked up a fierce 67.

Maybe the battle will be renewed at the beginning of next season, but maybe not, as by that time the fire will have died out of the contest. Perhaps the only way out is to share the trophy.

L.T.S. Football.—The league eleven have commenced operations in the senior division by two victories against Customs, 2-1, and War Office, 7-3.

The first match was very closely contested and there was little to choose between the two teams.

The War Office offered less opposition than the final scores suggest. Had it not been for a lapse on the part of one of the L.T.S. defenders it is quite probable that two of the goals scored against us would never have happened.

Several hard matches will be played within the next few weeks, including important cup-tie contests.

Royal and Monument Exchanges Swimming Gala.—These combined swimming clubs held their annual Gala at Pitfield Street Baths on Wednesday, Oct. 15.

The Royal Club championship was won by Miss Thorby, and that of Monument by Miss Medley. The Learners' race at any gala is always an interesting event, and Miss Kittle, of Royal, who won the race on this occasion, has promise of becoming a good swimmer.

In the Plunging competition Miss Reece, of Royal, made quite a good display with a distance of 39 ft. Miss Brook, of Royal, who was second in the club championship, won the Back Stroke race, and the Novices' race was won by Miss Philpott, of Royal.

An exciting event was the Inter-Exchange Team race, which was won by Royal.

Miss Carmichael proved her efficiency as a diver by winning the diving competition, always a difficult event to judge.

The Oxford and Cambridge boat race, represented by Royal and Monument, respectively resulted in the dark blues winning.

Miss Mayhew, of Monument, was the winner of the United Clubs' handicap.

An exhibition of Fancy Swimming by the Misses Coles and Elliott, who also undertake the arduous duties of judging, was a very popular event. The grace and style of their swimming was much admired.

The District Superintendent, Mr. Frank Gray, accompanied by Mrs. Gray, attended and Mr. Hugh Williams, the Chairman of the Sports Association, was also present.

The London Telephonists' Society.

The practice of devoting the opening meeting of the session to an address by the President for the year, is one of long standing, and has proved itself very popular with members of the London Telephonists' Society: it was, therefore, expected that a large number of members would be present at the City of London Y.M.C.A., Aldersgate Street, on Friday, Nov. 3, where Mr. F. B. Nichols formally commenced his year of office.

The chair was taken by the retiring President, Mr. P. J. Mantle, who, in a very charming speech, introduced Mr. Nichols to his audience. A hush of expectancy fell on the hall as the President commenced his address, and it was with a very real sense of pleasure that we realised, as Mr. Nichols read on, that we, who are accustomed to good speakers, were to hear one whose ease of manner and clarity of enunciation, lifted him to a high level.

The title of the paper—"Why are we here?"—was one of considerable ambiguity, and consequently had created great interest. It is impossible to give a detailed account of the lecturer's ideas on the subject, ideas which obviously showed a very deep consideration in the development of his thesis. We were reminded that the purpose of life is one of the great mysteries of the ages, and that neither its scientists, its divines, nor its men of letters have been able to supply a satisfying answer to that riddle but, we were told, life can be regarded as a place of preparation in which we make, each day, a small addition to the garment of our individuality. It was this basis of individuality that provided one with the real sense of the speaker's firmness of purpose and a desire "to ask of life no more than life can earn," and, one felt that with the attitude outlined to us, life had a capacity for unlimited earning.

To illustrate the conclusions reached, nothing could be better than a quotation from the lecture:—

"The lesson I have learnt from my start in life is this, that having once reached the conclusion that the job you are in is the one you are going to stay in, it is essential to school the mind to make that work, whatever it is, something that you like."

That the interest aroused in anticipation of the meeting was fully sustained was demonstrated by the discussion which arose at the conclusion



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of the address, when members of the Society expressed their views on the purpose of life. These views were as varied as the individuality of the speakers, and added greatly to the value of their remarks.

Mr. Nichols is to be congratulated in giving us a paper productive of so much thought and thanked for his goodness in devoting his time and energies to the London Telegraphists' Society.

Retirement of Mr. H. Cope.

Another interesting link with the early days of the telephone world has been severed with the retirement of Mr. H. Cope from the London Telephone Service, which took place on Sept. 20. Mr. Cope entered the service of the late National Telephone Company as a night operator, and in 1900 was appointed personal attendant to the late Mr. W. E. L. Gaine, General Manager and Solicitor to the Company, in which interesting capacity he was brought into contact with many of the prominent people who were at that time moulding the fortunes of the telephone administration of the country. Courtesy and tact were necessary qualities in the fulfilment of even minor duties attaching to Mr. Gaine's staff in those days, and Mr. Cope was possessed of these essentials to a marked degree. After Mr. Gaine's death in 1909 Mr. Cope was employed as a coin collector, and tribute to the conscientious manner in which he had performed his duties was paid by Mr. R. Tinniswood, the Assistant Controller, when presenting him with a clock on the evening of Sept. 19, in the presence of his colleagues.

In expressing the esteem in which Mr. Cope is held by all his colleagues, Mr. Tinniswood also expressed a hope that his retirement would be conducive to a return to better health, and that he would for many years be able to look back with pleasure to the happy days spent in the service of the company and the Post Office. Mr. Cope suitably responded.

Personalia.

Resignations on Account of Marriage.

Assistant Supervisors, Class II.

Miss N. Hamer, of Trunks, and Miss N. F. Yule, of Kingston.

Telephonists.

Miss D. Creswell, of Trunks.

" A. Bailey, of Trunks.

" D. E. Howes, of Grangewood.

" S. M. Hickford, of Archway.

" V. M. Butler, of Kensington.

" J. M. Wallis, of Barnet.

Miss O. M. Sanders, of Clissold.

" F. A. Weston, of Frohisher.

" F. G. R. Tuddenham, of

Paddington.

" I. W. Gibbs, of Clerkenwell.

" M. S. Elder, of Clerkenwell.

Miss E. R. Hughes, of Chiswick,	Miss M. Keetch, of Clerkenwell.
" D. M. M. Mowbray, of Central.	" H. L. Pawley, of North.
" R. Z. McKenzie, of Central.	" E. F. Coles, of Hop.
" M. I. Fleet, of Central.	" D. J. Outram, of Hop.
" H. I. Sime, of Western.	" M. B. Daverson, of Hop.
" M. A. Hyatt, of Wembley.	" M. K. Willecox, of Hop.
" M. L. K. Swift, of Museum.	" L. E. M. Ireland, of Royal.
" F. A. James, of Museum.	" R. Nosworthy, of Regent.
" L. D. Boulton, of Park.	" G. L. Smith, of Regent.
" F. M. Hartley, of Tandem.	" W. L. Morris, of Regent.
" F. A. Howse, of Tandem.	" K. A. Whitbread, of Chigwell.
" D. E. Hardinge, of Holborn.	" E. M. Noakes, of East.
" M. M. Webb, of Victoria.	" F. L. Mattson, of East.
" K. M. P. Johnson, of Terminus.	" E. E. Barnes, of Beckenham.
" M. A. C. Smith, of Avenue.	" G. M. Pain, of Streatham.
" P. E. E. Luxton, of London Wall.	" J. E. Micklefield, of Brixton.
" M. C. Dunn, of London Wall.	" H. L. Holloway, of Fulham.
" D. C. White, of London Wall.	" E. M. Wright, of New Cross.
" D. K. Dickens, of Clissold.	" M. Jessie Smith, of Gerrard.

C.T.O. NOTES.

Promotions.—Messrs. C. Land, T. A. Perkins and G. Francis, Overseers to Assistant Superintendents; J. Young, L. P. Schlarb, C. J. Hoy, W. H. Stenning, L. K. Cousins, E. J. T. Hill, Telegraphists to Overseers.

Retirements.—Messrs. J. H. G. Clifton, Superintendent (Lower Grade), J. Doust, Asst. Supt., W. H. Collins and C. J. Dowling, Overseers, G. W. Corps, W. S. Firmin and W. J. Geis, Telegraphists.

Obituary.—We regret to record the tragic death of Mr. J. W. Francis, who, 20 years ago, was a well-known Superintendent in TS. He was knocked down by a motor cyclist whilst crossing the road near South Parade Pier, Portsmouth, and died in hospital two days after the accident. The late Mr. Francis was one of the very few remaining links with the old Electric and International Telegraph Company, which he joined in 1865. He came to TS in 1873, and was eventually made Superintendent in 1908, retiring in 1911. We extend to Miss Francis the sincere sympathy of her father's numerous old friends and ex-colleagues.

Golden Wedding.—It is our happy privilege to record that the golden wedding of Mr. and Mrs. G. H. Hickman was celebrated on Sept. 29, 1930.

The Veterans.—The last outing for the season took place at Kew Gardens. Tea in the gardens under favourable weather conditions was thoroughly enjoyed.

The yearly subscription is one shilling, and all desirous of joining "The Veterans" should remit this amount to Mr. A. Dixon, 155, Jerningham Road, S.E.14.

Sport.—Bowls.—Central Telegraph Office Bowling Club.—The C.T.O. Singles Championship for 1930 was won by Mr. T. G. Donno, who defeated Mr. E. C. McCartie in the final game on the Civil Service Green at Chiswick by two shots, 21-19. Mr. Dunno, therefore, again holds the "Cooper" Cup, which he won last season when he defeated Mr. A. W. Edwards in the final round.

The C.T.O. Pairs Bowling Championship for 1930 was won by Messrs. G. J. Defoe and C. T. Drywood, who defeated Messrs. H. Stewardson and A. W. Edwards in the final by two shots, 25-23. The Rink Championship was won by the Plant and Traffic Section, represented by Messrs. F. S. Parker, R. T. Sutton, T. Galbraith and H. A. Songhurst (skip.). The runners up, the Threadneedle Street B.O. and Accounts Staff, were Messrs. H. Coase, J. Pedley, T. A. Lambert and J. Wesley (skip.). The scores were 23-16. Both finals were played on the Civil Service Bowling Association's Green at Chiswick.

Cricket.—The result of the season's play is as follows: Centels played 22, won 10, lost 8, drew 4. Mr. Cook, who has occasionally assisted the Surrey first XI, heads the batting average with 36.7, highest score 147. Mr. Drummond is close up with 31.5. The latter heads the bowling average with 10 wickets for 5.4 apiece, although Mr. Pepper takes the credit for the largest number of wickets, i.e., 42, at an average of 14.4, Mr. Bozzett with 33 is next highest.

Swimming.—The Annual Swimming Gala was held at the Pitfield Street Baths. It is happy to note that for the first time the meeting included both the Inland and Cable Room sides of the office and it was an unqualified success.

Miss Frederick (Hammersmith Ladies S.C.) and Mr. Wilkinson (Otter S.C.) gave a splendid exhibition of fancy and ornamental swimming.

Mr. H. Moore won the veterans' 33 yds. race.

The Civil Service Back Stroke Championship was won by Miss D. House (Regent).

The Amateur Diving Association members gave a skilful exhibition.

The 67 yds. Championship was won by Mr. H. Emblem.

The Polo Match between the Civil Service and the R.A.F. was well worth watching. The Civil Service won by 2 goals to 0.

The R.A.F. had their revenge in the Team Race.

The 100 yds. Civil Service Championship was won by Mr. W. F. Cockayne (P.O. Engineers).

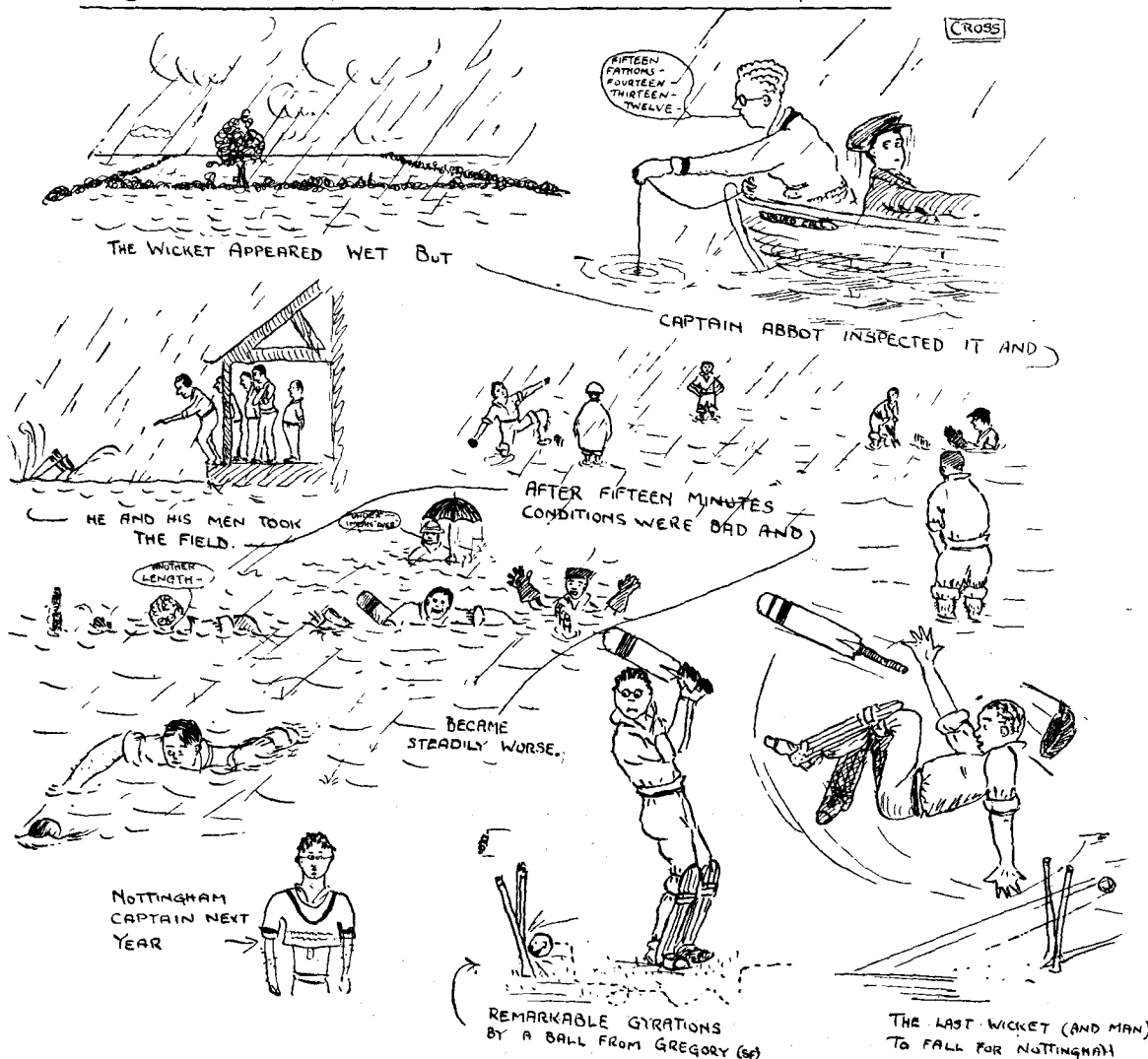
Operatic.—"A Country Girl."—This musical comedy marked a new departure in the history of the C.O.D.O.C., and it can be said that this ambitious club made history. Performed before three completely full houses at the Guildhall School of Music on Oct. 14, 15 and 16, the production was one of infinite care and thought.

The principal parts were played with extreme success by the following artistes: Miss Adeline Paterson, "Marjorie," Miss Winnie Lenthall, "Nan," Miss Marjorie Bryan, "Sophie," Miss Ellaline Gascoine, the "Princess," Mr. Robert Cooke, "Geoffrey Challoner," Mr. Bertie Figg, "Barry," and Mr. Arthur Boyce, the "Rajah." The smaller parts were extremely well portrayed. The chorus work was especially good, the dancing being particularly fine, and the whole production was in the capable hands of Mr. Donald Bidgood. Mr. Arthur Brough conducted a very efficient orchestra. Incidentally, this was Mr. Brough's last appearance as Musical Director, pressure of work in other directions having compelled him to relinquish this post. The C.O.D.O.C. have been fortunate enough to obtain the services of Mr. Charles Daggett, a well-known C.T.O. musician.

Murder on the Second Floor.—The first production of the Dramatic Section takes place at The Cripplegate Theatre on Dec. 3 and 4. Tickets, price 3s. 6d., 3s. and 2s. 4d., may be obtained from members of the Club or from the Ticket Secretary, Room 17, C.T.O., E.C.1.

NOTTINGHAM V. SHEFFIELD.

AT SHEFFIELD,
SEPT 17th



SHEFFIELD DISTRICT NOTES.

THE first of this year's cricket matches against the Nottingham District Office was played at the Y.M.C.A. ground, Trent Bridge, Nottingham, on Wednesday, Aug. 20, Sheffield winning by 4 runs.

The excellent tea which followed, and the whole event, was in keeping with Nottingham's reputation for hospitality.

The return match at Sheffield was fixed for Wednesday, Sept. 17, but the day broke with overcast sky and wicket sodden with overnight rains. Hopes of any play appeared very remote, but as the rain had ceased it was decided to make a start. The conditions were terrible. The ground oozed water, and shortly after play commenced the rain started once more. The "trojans" carried on, however, and soon the wicket was a sea of mud, but as everyone was wet through already it was decided to finish the match. On one occasion it was necessary to remove the ball forcibly from the mud, where it had buried itself. Sheffield again won, the scores standing at 46 and 60. This match will not be considered as one of the series.

After drying and changing operations were complete the visitors were entertained to tea, followed by community singing, accompanied by the Nottingham "orchestra," and judging by appearances everybody seemed perfectly happy. Tennis was enjoyed by the ladies on both occasions.

F. W. C.

THE Telegraph and Telephone Journal.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXXI.—MR. J. H. WILSON.

THE subject of our sketch joined the Head Office staff of the Lancashire and Cheshire Telephone Company on Jan. 11, 1885, at Faulkner Street, Manchester, where its historic switchboard was then in active use with primary batteries, without lightning arresters, with overhead earthed circuits only, both for local lines and its few short trunk lines. The telephone rental was then £20 per annum (subjected to both patent and Post Office royalties) and Manchester had, roughly, about 1,000 subscribers. In those far-off days there was no telephone literature, and no service or technical instructions of any sort or kind. Happy days they were, although strenuous and full of trials, opposition, and vicissitudes from both human and natural sources.

On the reorganisation effected by the late Mr. W. E. L. Gaine, in 1893, Mr. Wilson took up an appointment on the newly organised staff of the



District Manager, Oldham, in preference to an appointment on the headquarter staff. He was appointed Local Manager at Stockport (1896), Exeter (1899), and Nottingham (1902). He was promoted to be District Manager for the Luton (now St. Albans) district in 1907, and has seen that district grow until its number of telephone stations has increased twelve-fold.

Mr. Wilson finds bowls an interesting pastime, and thinks the game is benevolently given to telephone men for the same reason that fleas are given to dogs—to take their minds for a time from more serious pursuits.

In his long, uninterrupted period of service, Mr. Wilson may be said to have seen every step in the process of building up the telephone service as it is to-day; and, with the gradual retirement of other pioneers, he has claims to be considered "the Father of the House."

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVII.

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EUROPE'S TELEPHONE PROGRESS.

ONCE again we are able to publish tables showing in some detail a year's development of the telephone systems of the world. The figures for the calendar year 1929 show that an increase of nearly a million and three quarters has taken place since the end of 1928. Perhaps the most satisfactory feature of this year's statistics is the increase of 773,000 telephones in the total for Europe, representing over 8% on last year. Previous year's increases since 1924 have been 491, 612, 518, 521, and 644 thousand, while the percentage increases during the last three years have been roughly $6\frac{1}{2}$, $7\frac{1}{2}$, and $8\frac{1}{2}$ (1929). Europe, it will be seen, just failed to reach a total of ten millions, but by the present time its telephone development is considerably in excess of that figure. As we pointed out in a recent issue, its total has doubled in ten years, while that of North America has increased by 50%.

No great changes will be remarked in the relative positions of the various countries in the tables, although a careful study of the figures will reveal that as a rule the well developed countries (as is to be expected) have increased at a much slower rate than the more backward ones. It is noteworthy that Denmark, which in 1924 had 303,000 telephones, has now 336,000, while Italy, which in 1924 had only about 160,000 telephones, has now 352,000. Yet the telephone development of Denmark remains very much denser than that of Italy, as a glance at the tables will show.

We may here remark that the list of countries with a telephone density of at least 2% given in the first column of page 50, is obviously intended to show the sixteen best developed countries in the world. Those equipped with average knowledge are well aware that there are many more than sixteen countries with undisputed claims to be both cultured and progressive. Nevertheless,

by the simple process of cutting short the list at number 10, critics of the Post Office are fain to stigmatise Great Britain as last on the list, and amongst the "backward" countries. There are in fact 27 countries with upwards of 100,000 telephones which may conveniently be arranged in three groups:—I.—Those with over 4 telephones per hundred of population, viz.: (1) United States, (2) Canada, (3) New Zealand, (4) Denmark, (5) Sweden, (16) Australia, (7) Norway, (8) Switzerland, (9) Germany, (10) Great Britain. II.—Those with 1 to 4 telephones per hundred: (11) Holland, (12) Finland, (13) Austria, (14) Belgium, (15) France, (16) Argentina, (17) South Africa, (18) Japan, (19) Hungary, (20) Czecho-Slovakia. III.—Those with less than 1 telephone per hundred inhabitants: (21) Italy, (22) Spain, (23) Poland, (24) Mexico, (25) Brazil, (26) Russia, (27) China. The position of Great Britain in the list is clearly not so high as we might wish, but whether a State which is in the first group can properly be classed with the "backward" countries is purely a question of terminology. And the terminology of hostile criticism is notoriously inexact.

THE TELEGRAPH REARRANGEMENTS AT LEEDS.

In this issue is published an article on the new lay-out of the Telegraph Room at Leeds, which cannot fail to be of interest to those who are watching developments on the telegraph side. As the writer of the article suggests, other new lay-outs may produce modifications in detail of the latest model; but apart from this consideration it is safe to say that the arrangements at Leeds provide working conditions of a standard that has never yet been attained in the British Telegraph Service.

Those of our readers who are familiar with the recommendations of the Commission of Enquiry which visited the United States to study the organisation and methods of the American Telegraph Companies will no doubt recognise in this rearrangement one of the results of that visit. It will be seen that teleprinter working now predominates and that the general layout of the office is in close accordance with the recommendations of the report. It is encouraging to note the great increase in rapidity with which traffic is disposed of at Leeds (as recorded in the concluding paragraph of the article), and especially the inference that this improvement is due to the new lay-out conditions. We may, perhaps, express a hope that the favourable results attained at Leeds will not only be maintained, but will prove such as to encourage the adoption of similar rearrangements generally, and that they may, therefore, herald the dawn of an era in which the telegraph service will regain some of its ancient glory and proceed steadily towards more favourable economic conditions.

HIC ET UBIQUE.

Europäischer Fernsprechdienst for November contains a commentary on Mr. Medlyn's article on "Telephone Finance and Statistics of the American Bell Company and the British Post Office," contained in the *Post Office Electrical Engineers' Journal* of July, 1929. The article is rendered additionally interesting by the inclusion of the figures for the German Reich. The accom-

panying tables show that at the end of 1928 the percentage of automatic telephones in the United States (Bell system) was 23.4; in Germany 40 and Great Britain (March, 1928) 13. Since then, however, Great Britain's figures have made a notable increase, and exceeded 22% by June last. Other interesting comparisons show that in Great Britain 87% of the exchange telephone lines are underground, 85% of the German, and 71% of the Bell system, while of the trunk and toll lines 65% of the German are underground, 57.5 of the British and 38% of the Bell system. Of the total lines, therefore, this country comes out best as regards percentage of underground construction with 84.5, Germany next with 80.5 and the Bell system third with 66.1. Of course, as in all telephone statistics and comparisons, varying factors have to be taken into consideration, not the least of which are the enormous distances of prairie and mountain country to be spanned in America. Moreover, it has to be remembered that the figures for overhead mileage include lines in aerial cables which are very largely used in America—and, of course, should not be compared with lines on open routes.

With the conversion of the Christchurch Exchange to automatic working in September, 1929, says the report of the Postmaster-General for New Zealand, approximately 50% of the telephones in New Zealand were of the dial type. In the United States the proportion of dial telephones to magneto telephones probably does not exceed 25%. Thus, while the United States of America leads the world in the matter of telephone density, New Zealand has pride of place in regard to the percentage of dial telephones in use.

Some idea of the development that has taken place in automatic telephones in New Zealand may be gained from the fact that the proportion of dial telephones to the total number of telephones in use has arisen from 17% in 1923 to 50% in 1929. The conversion of the other manual exchanges now contemplated will still further increase the number of automatic telephones in use.

We learn from *The Electrical Review* that as part of a scheme for improving and modernising the telephone system of Vienna, automatic apparatus will be installed in all the exchanges of the city before the end of the current year. A new system of calling rates will, it is expected, be introduced simultaneously with the change-over.

By means of a submarine telephone cable, says Reuters Cologne Agency, which has recently been laid between Stralsund, Pomerania, Prussia, and the Swedish Coast, it will be possible for eighty-four conversations and one broadcast music relay to take place simultaneously. The cable is seventy-five miles long, and was manufactured and laid by a Cologne company. It is claimed that the eighty-five circuits contained in the cable is the highest number yet employed in a single sea cable.

The past year, says *The Electrical Review*, saw the completion of a telephone line encircling the whole of Iceland. Many difficulties were experienced owing to the fact that the supporting masts have in some places had to be erected where avalanches frequently occur. Another cause of trouble is the formation of ice on the telephone wires. Nearly every village or little parish on the island can, however, now be reached by telephone. The length of the wires in operation in Iceland has increased from about 800 miles in 1906 to 6,675 miles at the beginning of the present year.

Telephone affairs in America, as perhaps our readers know, are regulated in some States by what are known as Railroad Commissions. Apparently a change is resented, for we learn from *Telephony* that "Independent" leaders object to the telephone industry being tied up with a proposed new commission to control

communications. President McKinnon, of the United States Independent Telephone Association, says: "The Association desires to say that its members prefer to be hitched up with the railroad organisations than to be driven into the same corral with the kicking, biting herd that is known as the radio-industry."

The snort of the puff-puff is sweeter to us
Than the broadcasting boomster's cacophonous fuss,
For the telephone lamb would far sooner recline
With the known railway lion upon his main line
Than float insecure, like a terrified dove,
Amid radio-hawks in the ether above.

A writer in an American telephone periodical concludes a short apologue with the following moral: "Even the spider goes to no end of trouble and care to make a good window display. He knows that through this window display comes a good living."

One might almost conclude from this that it is the instinct of the patriotic American citizen (in the interests of a trade boom) to walk into the trap and let the commercial spider suck his blood.

"Ignorance is one of the chief causes of war," said an American Government official recently at Washington. "Intolerance is the child of ignorance. Modern wars usually grow out of racial and economic intolerance. With our present systems for the transmission of word and thought it should be possible for the people of the different nations to understand the people of other nations. An understanding of the motives of others would serve to eliminate many of the points of friction." On this our contemporary, *Telephony*, comments.

The amazing expansion of telephone service to the far places of the earth within the last few years is brought home to us when we hear that Government censors are now considering how to censorise telephone messages. The revolutions in South America last month turned the spotlight on this problem which is acknowledged to be particularly difficult in controlling wireless telephone communications.

At a critical stage of the revolution in Argentina the faction in temporary control of the Government censorised the cable messages, but over a wireless telephone circuit between Buenos Aires and New York, the newspaper correspondents were able to transmit the news without official interference.

During the Argentine revolution, London, 7,000 miles away, was in telephonic communication with the deposed president. Washington, 5,300 miles distant, received telephone messages from the new Government at Buenos Aires.

A large tabby, says the *Daily* ———, wandered into the General Electric Company's station at Schenectady, N.Y., yesterday morning, and became the first of her kind to speak to Australia. Engineers 10,000 miles apart were discussing the arcana of electro-dynamics when pussy appeared.

Jumping quietly on the table (says Reuter), she yawned and emitted a depressed miaow. In far "down under" an Australian heard it, and politely replied "Miaow."

Mewing to Australia.

Mewing to Australia,
All across the Seven Seas,
Where the tall ships go
(Ships in song are always "tall"),
Scudding in the breeze
While the trade winds blow,
Tabby made her call.

Mewing to Australia,
All the way from Schenectady,
O'er the rolling Spanish Main,
Where the great whales spout and thunder
(Or, at least, I hope they do)
O'er ten thousand miles relayed, he
Mewed through England, then again
O'er the ocean, till "down under,"
Tabby was "put through."

W. H. G.

[All references to "invoking the mews" will be discouraged.]

PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

By J. J. T.

(Continued from page 24.)

THE two cases referred to the Supreme Court, it is understood, are involved in a constitutional issue and are respectively WMBD-WOK and WCRW, both of Chicago. These stations were in operation prior to the enactment of the radio law of 1927, and the pleading is, therefore, on the ground of "deprivation of property in violation of the fifth amendment to the Constitution," as the decisions of the Federal Radio Commission involve refusal to renew the companies' licences. Both stations claim to have lost large sums of money. One of the other cases directly challenges the Commission's right to censor station programmes for indecent and obscene language by refusal to renew licences! Other cases are based on the refusal of the Commission to grant an increase of power, the "denial of construction permits for proposed broadcasters," and "definite orders demanding stations to change their wavelengths." While the Federal Radio Commission has been able to hand over part of their job to the United States Department of Commerce, the latter office has apparently, and that quite recently, reciprocated by transferring the licensing of all the 17,000 odd amateur—as distinct from the corporation—stations in the United States.

Then, too, it is recalled that a month or two ago the State of New Jersey took legal steps to defend "its right of denial or acceptance" concerning broadcasting organisations which wish to set up transmitters *within the confines of the State*.

It appears that the Federal Radio Commission granted a permit to the Columbia system to put up its new 50,000-watt transmitter at Columbia Bridge, near Morristown. This sets a legal precedent for every State in the Union and is to be contested by the New Jersey Radio Commission (a local body) who contend that the new (WABC) high-power transmitter, if placed near Morristown, will effectively blot out not only Morristown, but Montclair and other towns from a listener's point of view—or, shall we say, audition? New Jersey, with some justice as far as one can see at this distance, appears to have a case for real consideration. The point made by New Jersey State is that it should have some say in a matter where so powerful a broadcasting station is in contemplation without the people having a voice in the matter. It is claimed that such transmitters "ruin reception for neighbouring listeners." As recently as September last the Federal Radio Commission "held hearing" at Washington D.C. on no less than seventeen broadcasting stations, all of which were clamouring to use the maximum broadcasting power allowable of 50,000 watts.

Some idea of the popularity of broadcasting in the U.S.A. may be gathered from interesting figures published by the statistician of the National Broadcasting Company, who, in a survey of the wireless audience of the States, declares that the number of listeners forms 43% of the population, actually 12,824,800 families, giving a total of 52,581,840 actual men, women, and children.

The same official states that 75% of the receiving sets in use have more than five valves; 81% of the listeners use their apparatus two hours per day; the most popular listening period is between 8 p.m. and 10 p.m.; more than 52% of American listeners own sets over two years old. It is further calculated that the average nightly audience is 7,000,000.

There is no hint of the measures taken to arrive at these figures, say, for example, the 52% of loyal Americans who were content with old-fashioned installations prior to the autumn of 1928!

(To be continued.)

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

PRIZE COMPETITION.

IN January a new feature will be introduced in the *Journal*. A question will be set each month on one of the above subjects, framed on the lines of those set in Post Office and City and Guilds Examinations, and the solution will appear in a subsequent issue of the *Journal*.

The replies of readers will be judged by technical members of the staff, and a prize of a book will be awarded each month for the best answer. It is thought that this feature will be of assistance to those of our readers who are also students.

A further announcement on the subject will be made next month.

A CANVASSING EPISODE.

I RING the bell. A dog barks, and beyond this nothing happens. I try again, and this time add an official "rat-tat." A window is thrown open on the second floor and a cold, female voice enquires "Well, what is it?"

This is the kind of situation I never enjoy. Still, it has to be met. "Post Office," I shout, "I've come to talk to you about the telephone."

"I haven't got a telephone," comes the reply.

A passing policeman stops, folds his hands behind him, stands at ease and looks up. The milkman arrives and he looks up.

I resume the rôle of Romeo (without the romance). "No, but I want you to have one. Half-crown a week, no charge for installation," I yell.

A navvy working opposite expectorates, leans on his pick and looks up.

"I'll talk to my husband about it," says the lady, and "bang" goes the window.

Several necks resume their normal position, the dog stops barking and I pass on.

F. W. C.

BRISTOL DISTRICT NOTES.

WE extend a hearty welcome to Mr. R. A. David, Traffic Superintendent, Class I, who, a few weeks ago, came to this district from Liverpool. Mr. David's career has been spent in the North, and judging by the notices which our Liverpool friends have written of him, his work there seems to have been tempered by a propensity for "getting on" well with his colleagues.

We hear much of the North Countryman's "flair" for maintaining cordial relations with his neighbours, and we trust that Mr. David will not find that West Country manners in this respect are in any degree less pleasant than those he has hitherto enjoyed.

Bristol Automatic System.—The Bristol Automatic System is emerging from the "paper stage," and already in the 10 exchange buildings the equipment contractors are making progress. In the Central Exchange, where progress has been most rapid, there exists an air of bustle suggestive of an approaching crisis which tends to tune us up to the forthcoming rush. Already the engineers are proceeding apace with the conversion of the subscribers' instruments and the vast amount of underground work involved in the diversion of several thousand lines from one exchange to another. Firm forecasts of junction and trunk requirements are being prepared in the Traffic Department, and the Contract Department are busy examining the growth of private branch exchange installations to assist the engineers in their work of altering subscribers' apparatus. We expect that the Distribution Lists will be upon us before long, and then the efforts of all departments will be concentrated. Bristol will rank among the largest multi-office systems in the country, but with the proper co-operation between the departments concerned, there is no reason why its transfer should not be at least as successful as the best transfer yet effected. Everyone associated with the Bristol

Telephone Service will, in some degree, be concerned, but we are certain that, despite the busy and somewhat difficult times ahead, our staff, from the junior telephonist upwards, will, as in the past, rise to the occasion.

Lectures to Schools.—In extension of the system of lectures to schools recently inaugurated by the Telephone Development Association, the District Manager, Mr. A. G. Bristow, has, with the co-operation of the Bristol Education Authority, launched a series of lectures, illustrated by lantern slides, to the senior scholars of most of the Bristol schools. The curriculum of the lectures covers a brief history of the telephone, with a general description of the principle of its operation and the variety of its uses. The lectures are designed to help the younger generation to familiarise themselves with telephone facilities, and as these scholars will, within the next few years, constitute a substantial proportion of the telephone using public, it is likely that the seed now being sown will, in time, benefit the Telephone Service no less than these potential users themselves.

Social Arrangements.—The Operating and Engineering Staff in the Bristol Local Exchange have always shown a propensity for enjoying themselves, and in past years they have arranged a number of successful social functions. So successful have they been that a more comprehensive programme has been arranged for this winter. Dances, whist drives, parties, and concerts are listed in due proportion. Up to the time of writing two functions have been held, and their success augurs well for the remainder of the season. We hope that the efforts of the Social Committee will continue to command the hearty response they deserve.

THE PSYCHOLOGY OF TELEPHONE SALESMANSHIP.

By A. G. ORCHIN.

It may be interesting to my colleagues past and present if, as one comparatively new to the art of telephone canvassing, I set down my primary impressions on this "art," if it may be described as one, that is being assiduously fostered by the Post Office in their desire to keep abreast with modern commercial practice. In recognising advertising by the personal medium as a valuable asset to telephone development, the Post Office set a precedent, which I venture to suggest has never hitherto been attempted on such an extensive scale.

It is to the credit of the Departmental Chiefs to realise, that by the method of direct personal approach only, increased and more remunerative business can possibly result. To those who may be pessimistic as to the results shown up to date by the wholesale drive that has been in operation for the past few months, I would suggest that a "Sales Department" of any description which can produce an even balance of sales throughout such a distressing and far-reaching trade depression as has existed, and yet exists, reflects nothing but praiseworthy effort. This depression has been scoffed at in some quarters, but in the minds of those officers, whose duty brings them into daily personal contact with commercial houses and the public at large, no doubt exists whatever that this depression is very real, and has been general throughout industry.

To return to the personal element in canvassing. Let it be said that a Contract Officer should of necessity possess the tact of a diplomat, the plausibility of our friend Mr. Drage, and should be an ardent student of the "Freudian" school. The psychology of the great British public is truly amazing, when one is called upon to sell an article, the need for which, although universally recognised, is considered an imposition by the rich and a luxury by the middle class. From the first there is a considerable amount of prejudice to be dispelled—prejudice which, though unwarranted, indisputably exists against anything associated with governmental control. This, to my mind, should, on the contrary, be the hallmark of genuineness. We often hear views expressed as to "Government monopoly"; it would appear, however, that people do not generally realise that the profits accruing from this state service, in augmenting the state coffers, relieve taxation in other directions, and thus directly benefit "John Citizen."

Canvassing calls for the utmost discretion, and it behoves every Contract Officer to be the very acme of courtesy in the face

of what might be described as provocative criticism. It is essential to judge one's man during the first few moments of an interview. Upon this judgment should depend the trend of the conversation, the success or otherwise of which will decide the ultimate issue. There is the person with whom we are all acquainted, flattery of whom discreetly applied serves to further the cause; then, again, we have the very high-brow type of individual who must be approached in the most deferential and obsequious of manners, "Ich dien" should be the keynote here. From experience gained in canvassing the various types of people that go towards making the telephone world, one clear fact emerges which to my mind represents a very important factor in salesmanship, that is, the ability to dispel in one's preliminary remarks the idea dormant in most people's minds that one has come with the specific object of selling something. If that is not done one is up against a psychological barrier which neither eloquence nor persuasion can surmount, and which, far from favourably impressing the person, may place him in an antagonistic frame of mind. The selling proposition should not be propagated until the time is considered ripe. After the polite preliminaries, enquiries as to the prospective subscriber's health, business welfare, and general well-being, then would it be considered expedient to produce the "rabbit," the actual method of approach being determined, of course, by the preceding conversation.

There is the well known dodge of playing Mr. A. against Mr. B. and *vice versa*. There is the complimentary and suggestive method, to quote "What a wonderful business you have, Mr. A.—all credit to your organisation and acumen. I marvel, however, that you get along so well, with such a scanty telephone installation," and so forth, *ad infinitum*. This method, I may add, is far to be preferred to the aggressive "You must do this" and "You must do that" style.

Similarly with the residential subscriber—"What a charming room, Mr. A., but what a pity that you do not increase its charm and utility by availing yourself of our numerous supplemental facilities." By these means one tends to get on a personal and friendly basis with people, thus inspiring the confidence which is essential to all successful business undertakings. Canvassing has its humours, too. On one occasion I called on a non-subscriber. A lady answered the door. "Good afternoon, you are the Sanitary Inspector, I suppose!" In the face of that greeting I retired ignominiously.

Then, again, a canvass call at a flat. The maid takes a visiting card. "Will you come in, sir?" A charming lady receives me and, after preliminary verbal skirmishings, says "You have the air of being *en rapport*, do you attend the seances?" "Oh, yes!" replied I, "many in fact," thinking of the irate subscribers that I had been interviewing earlier during the day. "Do you think you could communicate this afternoon?" interjects the lady. Not wishing to be involved in further spiritualistic discussions, I offer a buff card in lieu and flee. Once again, a case of mistaken identity, a call at a branch of a world-famous association. Received by steward, I am conducted to the musty and cobwebby depths of the cellars. Much to my surprise, he requests quotations for points here and points there. Greatly wondering, I quoted steadily from Plan one to Plan ten. It was not until the question of removing a meter was broached, however, that I realised that I had been mistaken for the gas-man.

Such is a Contract Officer's daily task, a task that is temperamental to the extreme, and which provides an interesting and absorbing study of human nature, a study, that if not edifying, is at least educating.

As time progresses and new methods supersede the old, I am convinced it will be even more emphatically realised that the personal contact method will go far towards promoting that consolidation of interests and congenial relationship between those whose duty lies in the administration of this most important of public services, and the people who rely on that administration for their service.

THE COMING OF THE MODEL TELEGRAPH OFFICE.

By C. H. MANSELL, CHIEF SUPERINTENDENT, TELEGRAPHS, LEEDS.

It has been suggested that the application of the term "model" to the rearranged Leeds Telegraph Instrument Room constitutes a misnomer because, in the nature of things, a converted structure can hardly be regarded as a true model. Nevertheless, whatever may be the validity of this comment, it may not unfairly be claimed that, in so far as the modernisation of the British Telegraph Service will affect (I think without exception) converted Instrument Rooms, the new Leeds Instrument Room, at present, can be regarded as the model, but, no doubt, like all first models, it will suffer eclipse when later models are on view.

From the Leeds standpoint the coming of the model office began in January, 1929, when the first teleprinter was introduced on the Leeds-Preston circuit. The next teleprinter installation, however, did not take place until May of the same year, when the Leeds-York circuit was converted. A little over three months later, Leeds-Halifax became a teleprinter circuit, while two months later, in October, the Hull Fish Market teleprinter was installed.

From this time the influx of teleprinter apparatus into Leeds was greatly accelerated, and within the next year 33 additional circuits had been so equipped, the total at the present time being 37 teleprinter circuits, 4 fully-wired reserve positions and 10 spare teleprinter boards. (At the Leeds Stock Exchange Branch Office a teleprinter set with a fully wired reserve position has also been installed.)

When the accelerated programme came to hand late in 1929 steps were taken to expedite the training of operators in touch typing. This specialised training had commenced in 1928 in advance of the first installation on the Leeds-Preston circuit in January, 1929—17 officers passing the test before the end of that year. By the end of 1929 35 more had qualified, and during the present year 79 have passed out from the Telegraph School. February and March of this year were peak months, 17 and 18 officers respectively qualifying for teleprinter working in these months. In April it had become evident that the efforts which had been made to keep the operator resources abreast of the abnormally rapid introduction of teleprinters had been successful.

While these changes of equipment and the staff training were proceeding, the actual planning of the structural and engineering work was being considered. Conferences with the local engineers and the local Office of Works were held by the Postmaster-Surveyor (Lt.-Col. Jayne, D.S.O., O.B.E., M.C.), at which representatives of the Telegraph Traffic Section of the Secretary's Office and of the Engineer-in-Chief were also present.

It was decided to prepare for the lay-out changes and structural alterations by first clearing a space for the erection of the new apparatus racks, and also for the first table belt conveyors, while, simultaneously, the Office of Works prepared the new double tables and the new partitions. It was hoped, at this time, to have one end of the old Instrument Room entirely vacated before the partitions between the new Instrument Room, the new Phonogram Room, and the new Writing Room were erected. In the end, however, this was found to be impossible, and for a week the concentrator was practically isolated from the main portion of the office.

The first six bays of the new apparatus racks were put into position on June 20 of this year, the two complete rows of 36 bays being completed by Saturday, Sept. 27. On this date every teleprinter circuit was being worked through the new racks and by the following Monday, Sept. 29, the Phonogram end of the room had been evacuated.

Although all the apparatus had now been accommodated within the restricted area of the new Instrument Room, it had not yet been possible to erect all the new tables, although the metal structures for the table conveyor belts were in position.

It may be interesting to reproduce the progress schedule as it appeared on Sept. 27:—

Apparatus Bays, Wiring, &c.

Forty teleprinter sets now connected through the apparatus bays

Tables.

Table (double) No. 1.	—Not yet erected.
" " " 2.	—Erected but apparatus not yet in place.
" " " 3.	—Erected and wired but apparatus not yet in place.
" " " 4.	—Complete and working.
" " " 5.	—
" (circulation) " 6.	—Ready for fitting message racks.
" (double) " 7.	—Half complete and working. Half erected but not yet wired for apparatus.
" " " 8.	—Complete and working.
" " " 9.	—Half erected, but not wired. Half not erected.

Conveyors.

Erected but not working.

Partitions.

One erected but unglazed and unpainted.
One not yet erected.

A strenuous fortnight ensued, conveyor-fitting, table-erecting, laying of floor covering, erection of partitions, furniture removing, painting and decorating being carried on simultaneously. By Oct. 11 the main portion of the work had been completed, and the Instrument Room was reported on as ready for inspection.

Here a tribute must be paid to the very effective co-operation of the staffs of the Superintending Engineer and Office of Works, who carried out the work of reconstruction and rearrangement in a remarkably expeditious and mutually accommodating fashion, and with the minimum of inconvenience to the commercial branch. (It has to be remembered that the engineers not only had to carry out primary changes from morse to teleprinter apparatus but also had frequent re-positioning to do in addition to the erection of the apparatus bays and entire re-wiring of the room.)

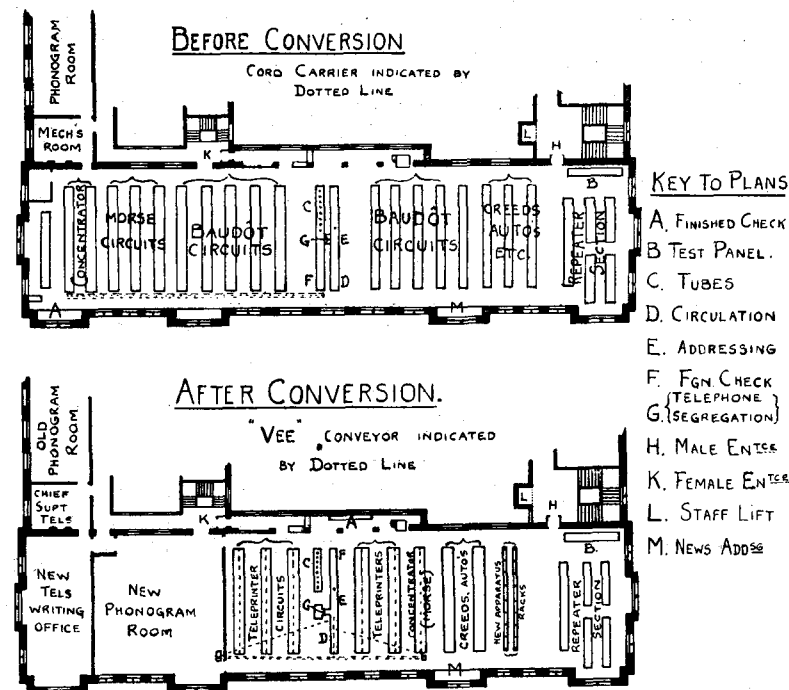


FIG. 1.

It will be seen from Fig. 1 that the economy of space effected by the rearrangement amounts to one-third of the original floor area, the former length of 180 ft. being reduced to 121 ft. 3 in. 2,478 sq. ft. have been recovered, of which 1,596 sq. ft., adjacent to the new Instrument Room, is to be the site of the new Phonogram Room, and the remaining 882 sq. ft. will be available for other purposes.

The 21 operating tables (i.e., excluding the tables in the Test and Repeater Section) have been replaced by 8 double tables, which, with the circulation and tube tables is the equivalent of 18 of the old tables.

The saving in floor space is directly attributable to:—

1. The removal of all possible apparatus from the tables to the apparatus racks, thereby allowing the table width to be reduced to 1 ft 9 in., and
2. The pairing of the tables to make one double table with a longitudinal opening 2 in. in width along the centre to accommodate the conveyor belt container.

All the teleprinter circuits are accommodated on four double tables, each double table having telephonic communication with the apparatus racks. A fifth double table accommodates the morse concentrator positions. Two more double tables, but without conveyor belts, accommodate the news (creed) circuits, and there is one double table to spare. The horizontal conveyor belt associated with each double table travels about 6 in. below the surface level of the table. When a telegram is dropped in, the telegram rests on its edge on the moving belt, and supported by the wall of the belt container, travels in an upright position to the end of the table where a "riser" belt receives it and carries it up and deposits it in an overhead horizontal conveyor travelling at right angles to the tables. The telegram is then carried along to the circulation table, where it is released to fall through a sloping chute (Fig. 4) on to a slow moving band, which passes before the circulation officers. The farthest distance to the circulation point is covered in 22 seconds. The distribution from the circulation table is done by girl probationers, with the exception of two overhead belts which serve the morse concentrator and the new Phonogram Room respectively. A telegram travels by these belts in 14 seconds, and is released at a drop point, where it falls between an enclosing circle of light hanging chains to the table.

The circulation table, the addressing table and the telephone segregating position, taken as a whole, presented a somewhat difficult problem, and, although the present arrangement is working well, a crowded appearance is presented, and it is probable that a more spacious rearrangement of these positions will be attempted. At present telephone telegrams are passed from the general circulation officers to the two segregating, or more properly, perhaps, "marking" officers, who sit *vis-a-vis* at a "T" shaped table, which projects at right angles from the main circulation table. The telephone marking officers consult Bizada lists for the appropriate number and, having marked the number on the form, drop it into the Phonogram Room belt conveyor, which is within reach of both officers. Telegrams for hand delivery are sorted into a compartment on the main circulation position, and are conveyed by a girl probationer to the addressing position beyond the telephone marking officers. The present stencil addressing system is giving place to

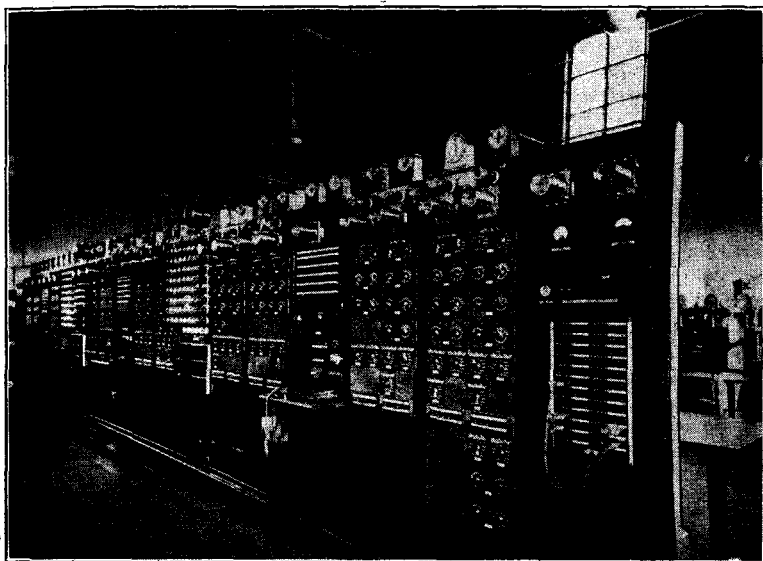


FIG. 2.

the "Addressograph," and, when the new method is in proper working order, the prepared addressed envelopes will be picked out from a container, which, it is hoped, will be sunk into and level with the top of the table.

It is interesting to note that the disappearance of cages, as a result of the conveyor belt system, entailed the invention of some provision for circuit cards. This has been achieved very satisfactorily by a specially cut card, which is fitted by means of a vertical slot on to the top of the message container on the teleprinter. At the concentrator positions the forwarded traffic, when disposed of, can no longer be filed on a hook. For the present this traffic is being left face downward behind the morse key until it is collected for final treatment at the Finished Check position. No difficulty has yet arisen from this practice.

It is not for me, of course, to attempt to give an authoritative technical description or explanation of the technical facilities afforded by the new apparatus arrangements, and I am almost wholly indebted to the engineering officers associated with the technical changes for any information I may have gathered. A short description, however, of the apparatus racks and their equipment will, no doubt, be expected, and the following somewhat loose account of the new facilities will serve, perhaps, until the authoritative and scientific description is available.

The facilities include standardised relay adjustment with special relay testing devices, ready monitoring of outgoing or incoming signals, testing of voltages, lines and apparatus, transfer from bay to bay, and a universal transfer (i.e., a special panel (Fig. 2) whereon any teleprinter position in the room may be transferred to any line terminated on the racks without the necessity for re-balancing). This special transfer panel is shown clearly on the right of the picture in Fig. 2, with plugs and cords in position effecting transfers. Immediately above the transfer panel is a row of keys used in connexion with the standardised relay tests. Reading from left to right they are designated as follows:—

- 1 and 2 (coupled).—Speed Test.
- 3.—Calibration.
- 4.—50 cycles per second neutrality.
- 5.—Percentage contact at 50 cycles per second.
- 6.—Sensitivity test.
- 7.—Battery cut off.

On the extreme left is a jack for "Input for speed test."

Immediately above these keys on the left is the microammeter for the speed test, and on the right the differential milliammeter neutrality indicator. Above these again can be seen the standard relay on the left and the relay to be tested on the right.

The standard relay tongue vibrates with a frequency approximating to 50 cycles per second. The relay under test is operated by these reversals. Before testing a relay, the standard relay itself is proved by a calibration test, keys 7 and 3 being operated. The function of key 7 is to join up a battery to the panel and key 3 closes the vibrating circuit of the standard relay. The impulses from the oscillating tongue of the standard relay pass through the neutrality indicator milliammeter, and any bias that may be shown can be corrected.

The relay to be tested (which must not be in position while the calibration test of the standard relay is being made) is then put on to the panel and keys 6 and 7 are operated. A current of 1 m.a. then passes through the relay coils. This current is reversed as key 6 is put to the "up" or "down" position. The tongue of the relay should respond to these reversals of the key and the milliammeter which is in circuit with the tongue of the relay should show deflections reversing with the relay tongue. No reversal of the deflection indicates bias or insensitivity.

The test for neutrality at 50 cycles per second is made by operating keys 7 and 4. Key 4 closes the vibrating circuit of the standard relay and connects the tongue to the line coils of the relay under test. The tongue of the relay under test responds to the reversals from the standard relay and neutrality or bias is indicated on the milliammeter by zero position or a deflection.

The percentage contact test at 50 cycles per second is very useful, as it determines the percentage efficiency of the relay under test at a glance. Key 5 is thrown in addition to keys 7 and 4, joining the negative pole of the battery to both contacts of the relay under test. The oscillations of the tongue of the relay under test, therefore, do not now reverse the current through the milliammeter and a constant (though not a full) deflection is shown. A full deflection would appear if no oscillations of the tongue were taking place and the tongue were resting on one contact. The diminished deflection which actually appears is diminished proportionately to the loss of contact during the transit of the tongue from one contact to the other, and is actually proportional to the effective contacts made by the tongue on the spacing and marking stops. As the full scale deflection on the milliammeter represents 10 m.a. any lesser deflection indicates the percentage of effective contact (e.g., 9 m.a. deflection shows 90% effective contact). A simple and quick means of determining the quality of a relay's efficiency is thus provided.

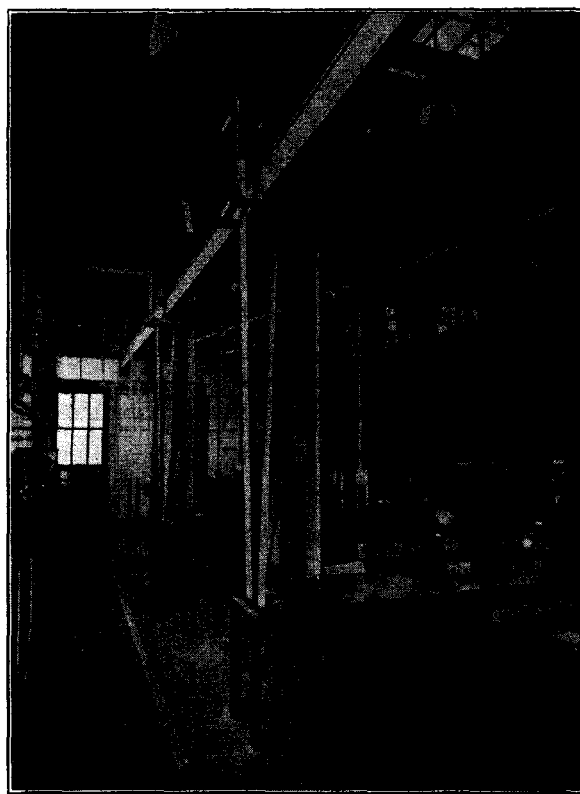


FIG. 3.

A speed test can be made by means of keys 1 and 2, which are coupled. When these coupled keys are depressed along with key 7, the normal connexions of the standard relay are disconnected, and a special arrangement is substituted whereby the deflection on the microammeter is proportional to the speed at which the tongue of the standard relay is oscillating, and a direct speed reading is given on the microammeter scale in terms of words

per minute or cycles per second. To make this test the coils of the standard relay are connected to the vibrating circuit under test by means of cord and plug in the jack, which is to be seen on the left of the panel.

To the left of the relay test panel will be seen the series of apparatus bays. The line galvanometer, which is pivoted so as to turn *towards* but not *from* the test bay, is shown on the top of the first bay to the left. The resistance lamp is immediately underneath, while below the resistance lamp again is the line relay. (The unusual horizontal position of the relay may be noted, the tongue being in a vertical position with its pivot below so that the tongue normally rests on a contact automatically.) Then come the rheostat, condensers, condenser coils and resistances. The testing keys are shown between the horizontal white labels, and below these is the "G" relay vibrating apparatus. This arrangement is reproduced on all the apparatus bays except where the "G" relay equipment is not provided. Every series of four apparatus bays comprising eight circuits has an associated test bay serving four circuits on either side. The test bay shows the leak and test galvanometers at the top with the leak relay underneath. Below the leak relay is a panel of six rows of jacks to which are connected the terminals of each rheostat, line relay and teleprinter. The telephone to the operating table is visible below the jacks and underneath are the various leak keys, and two "U" link tablets, 3 hole and 7 hole respectively, the 3 hole for voltmeter testing and the 7 hole for the test galvanometer.

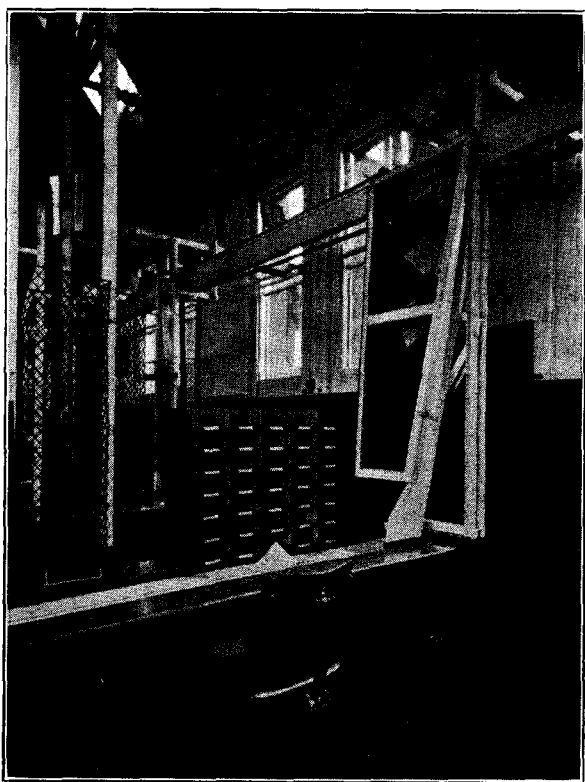


FIG. 4.

On the projecting ledge are the morse key and sounder with the plug for the test teleprinter. The cords and plugs for use on the transfer panel can be seen hanging on the ledge.

Further on can be seen the power panel with the battery lamps showing in rows. On the top of the bay is the voltmeter, and a fuse tester is provided below the lamps. Immediately below the fuse tester are the loop battery cut outs, and at the very foot of the bay may be seen the square movable panel behind which are the universal battery cut-outs. This is identical with the old standard fuse case whereby voltages can be readily changed by means of screw-ended cords.

A foot rail to prevent the travelling trolley bearing the test teleprinter from accidentally striking the racks can be seen.

The photograph shows a complete rack comprising 12 circuit bays, 3 test bays, 2 power bays and one relay test bay.

The testing keys shown on the apparatus bay between the white labels are labelled as follows from left to right, the top row indicating the "up" position of the testing keys and the bottom row the "down" position.

Top Row	...	Test set to line.	Morse.	...
Bottom Row	...	Teleprinter.	Test set to Local.	Resistance. "G" on. Receive.

At the extreme left of the photograph a teleprinter can be seen on the trolley standing at the bay for testing purposes.

No technical adjustments are now undertaken by the sectional overseer. In any case of interruption or difficulty the maintenance officer (an S.C. & T.) at the apparatus racks is called by means of the table telephone. The circuit is immediately monitored by him and he then carries through whatever requires to be done. Owing to the additional operation of communication between the sectional overseer and the maintenance officer a slightly longer time may now be taken over minor adjustments which were formerly immediately undertaken by the sectional overseer, but the many other advantages gained by the removal of all the adjusting apparatus to the racks outweigh this very minor disadvantage completely. When large offices are equipped generally with the new racks and the maintenance staffs everywhere have become thoroughly conversant with the facilities afforded under the new conditions, a great improvement should accrue in the time lost through apparatus trouble.

The present maintenance officer attendances at Leeds are of a tentative character and may be modified after further experience has been gained. At present four S.C. & T.'s do maintenance duty from 7 a.m. to 11 a.m., three until 3 p.m. and two from 3 to 8 p.m.

In time, no doubt, standard routine instructions to be followed in connexion with the various phases of maintenance duty procedure will be issued and then, with all offices working on a uniform system, the maintenance work should be considerably accelerated.

Minor details of equipment which are being tried out include gumming desks, bottle moisteners, thimble tape cutters, chronostamps and Blick Time Recorders. A master clock controls the Blick Time Recorders. The telegraphist inserts the form face downward and imprints the circuit particulars and time of reception on the form by depressing a hand lever.

Fig. 3 shows a "riser" belt carrying forms up from the table conveyor to the overhead conveyor.

Fig. 4 shows the central terminus of the overhead conveyor discharging forms through the chute on to the slow moving belt at the circulation table.

Considerable financial economies have been effected as a result of the rearrangements. The substitution of teleprinters for Baudot and Morse circuits has enabled staff saving to be effected at Leeds as elsewhere. In addition, there is a large saving in girl probationer force, due to the installation of the belt conveyors, and a considerable rental value for the recovered space is also on the credit side.

There are, of course, engineering, &c., costs to be set against these savings, but the net result appears to be such as to justify progress on the new lines elsewhere. The outlook for the offices which will have profited from the Leeds experiment is very promising.

It is interesting to observe that the Leeds tablet check return taken on Nov. 6 shows 97% of the traffic to have been disposed of under 15 minutes delay. This figure is the culmination of a period of progressive improvement in the quality of service in the Leeds Instrument Room, and has never been equalled here. It is not unfair to infer that the improvement over the previous best of 91% in March of this year is due, in a considerable degree, to the reduction of the office drag under the new lay-out conditions.

SOME APPRECIATIONS OF PROMPTITUDE IN THE TELEPHONE SERVICE.

It is perhaps characteristic of English love of fair play that the London Telephone Service, as a result of a recent campaign against it in the Press, should have received during the last six weeks or so quite a spontaneous crop of commendatory letters. This is the more gratifying, as it is notorious that the average man more readily takes up his pen to complain of a grievance than to render thanks for benefits received from a public administration. In the present instance, however, the campaign referred to really seems to have had the good effect of moving subscribers whose needs have been ministered to with special promptitude to take the trouble to express in cordial terms their appreciation of the staff concerned or of the administration in general. All the 23 letters which lie before us bear dates ranging from September to the middle part of October. They come from such varied classes of subscribers as private residents, societies, associations, manufacturing companies, West End tailors and costumiers, and theatre ticket agents. We append extracts from some typical letters:—

[1]

I expect that from time to time you receive complaints from the public regarding the alleged inefficiency of the Post Office and may, therefore, be interested to know that there is another side to the story, even from the public point of view.

On Thursday last Mr. ——— was taken ill with bronchitis and asked his wife to ascertain from me how they might obtain an extension instrument. A letter in accordance with the copy attached was posted at 11 p.m. on Sept. 11. At 9 p.m. the following evening the agreement form was received and at 9.30 a.m. on Saturday, Sept. 13, the fitter arrived with the instrument, the work being completed at 11 a.m.

When I informed Mr. ——— that I had not taken any special action and that the Post Office had dealt with his request strictly on its merits, he agreed that this was a remarkable performance in view of the routine in several departments of a large organisation.

[2]

With regard to my letter of Sept. 3 on the subject of the transfer of telephone at Wallington, I wish to thank you very much for the efficient manner in which this was carried out with the minimum of delay.

Perhaps you will be good enough to pass on to the Department concerned my appreciation of their efforts.

[3]

I wish to express my sincere appreciation and gratefulness to you for so efficiently transferring the telephone from our old house at No. 40, Talbot Road, to No. 28, as I had particularly requested.

I was surprised to find that on the actual day of our removal, before 12 o'clock noon, we were able to put the telephone in use. This is extremely efficient, and I earnestly thank you.

[4]

May I take this opportunity to compliment the "Service" on the very businesslike manner they attended to my application. To have an application accepted and the 'phone operating within four days is certainly something to be proud of.

[5]

We are writing to express our appreciation of the way in which your inspectors, engineers and fitters have handled the transfer of our telephone system to our new premises. The work has been carried out with despatch and promptitude, without a single fault, and we have had no complaints from our customers through interference with the working of the lines. This is the third time that your department has been called upon to move our telephone system in four years, and on each occasion we have received the same courtesy and efficient service from all concerned.

[6]

It may interest you to know in connexion with my recent removal to the above address I have had dealings with a large number of firms of various kinds, and the only work that has been carried out, without error and with reasonable speed, has been the installation of the telephone.

The enterprise shown (e.g., by the supply of post cards for notification of change of telephone number) has compared more than favourably with that shown by the other concerns.

[7]

It is perhaps a small matter to you to receive a word of thanks from one of your numerous subscribers, but I take the trouble to write because one hears so much of the inefficiency side of the question that it is a pleasure to be able to express my deep appreciation of the courtesy of your officials, the ready response to all inquiries and the businesslike and practical methods actually in force.

[8]

May I express my appreciation of the rapidity with which my telephone was installed, which is quite inconsistent with the complaints published so frequently in the newspapers. A private firm has taken over twice as long to instal a geyser—a not inapt analogy.

REVIEWS.

"*The Romance of the Civil Service.*" By Samuel McKechnie. London: Sampson, Low, Marston & Co. 241 pp. Price 6s.

Mr. McKechnie has produced a very readable and informative book. As Mr. Snowden says in his foreword, he tells an attractive story in a fascinating way. For, after all, the history of the Civil Service is attractive—attractive in the normal sense—especially to ourselves, and attractive with the allure of terror to those worthy diehards who see in its constant expansion the nightmare growth of some incubus or vampire. Mr. McKechnie has a witty style and an all-embracing ken. He views the Civil Service historically, politically, pictorially, socially, admirably, critically and even morally. Every kind of officer who ever served an English king or government is swept into his net from the days when such

officers were exclusively clergy to days when they are uncom- promisingly secular. He relates the early history of the Treasury from the time when the king carried that august institution about with him in a chest. But when it grew richer it was housed in the Palace of Westminster behind massive and well-guarded walls. Modern stories of motor bandits pale before the enterprise of Richard Podelicote in the fourteenth century, who, with the aid of 40 clerical and other confederates robbed the Treasury, carrying off sacks and hampers full of treasure. It is satisfactory to know that the ringleaders were captured and hanged and the monks sent to the Tower. We are informed that the Exchequer kept their accounts by means of notched sticks, or "tallies," and that the use of these tallies was actually continued until 1826. Mr. McKechnie has much that is interesting to say of Whitehall and the older departments, and provides useful accounts of the rise of the newer ministries. The book is well illustrated throughout, the reproductions of numerous old prints of Whitehall, Somerset House, the Custom House, St. Martins-le-Grand and other historic scenes being especially acceptable.

Two chapters are devoted to the Post Office, including its engineering side, and we are reminded that the really fast and reliable mail coach did not reach its prime much before the opening of the Liverpool and Manchester railway. Its glory, which so many writers have sung, was very short-lived, for the last London mail coach was withdrawn in 1846.

An interesting chapter is that on Civil Service men of letters. It comprises Chaucer, Milton, Pepys, Addison, Steele, Burns, Lamb and many others, down to Trollope, Dobson, Gosse and Walkley. Mr. McKechnie is much concerned to point out that Civil Service writers are not of the kind who deviate considerably from the accepted standard of morals. "Like Chaucer," he quotes Nicholl, "Burns was a great moralist, though a rough one." Taking the rough and the smooth moralists together (of which class was Pepys?), we may concede his point. "But read further," as the old Anatomist of Melancholy says.

"*Quantum Chemistry. A Short Introduction in four Non-Mathematical Lectures.*" By Arthur Haas, Ph.D. Published by Constable & Co., London. ix + 77 pp. Price 6s. net.

The development in the knowledge of the structure of the atom which has taken place during the past quarter of a century has thrown light on many problems of chemistry, and has enabled explanations to be given of a large number of facts which previously had to be accepted on a purely empirical basis.

The records of this advance in knowledge are, in general, only accessible to those who can bring to their aid an extensive mathematical equipment. The matter, however, is of great importance, and Dr. Haas is to be congratulated on having, in the small book under review, presented the subject in a simple non-mathematical manner.

The four lectures deal respectively with the arithmetic of chemical periodicity, the quantum theory of valency and chemical forces, electron grouping and the periodic system and quantum problems of molecular and nuclear structure. The get-up of the book is good, and we can recommend it to anyone interested in the subject who desires to obtain an idea of the trend of this particular department of scientific thought and investigation.

"*Definitions and Formulae for Students*" (*Electrical Installation Work*) by F. Peake Sexton. Sir Isaac Pitman & Sons, Ltd. 26 pp. 6d.

This handy little work comprises definitions, a list of symbols and units, wire tables, particulars of cables, thickness of insulation, capacity of fuses and conduits, &c., formulæ respecting heating, motors, and illumination, and much other useful information within a small compass.

TELEPHONE DEVELOPMENT OF THE WORLD AT THE END OF 1929.

By W. H. GUNSTON.

A SUMMARY of the latest statistics available shows that there were approximately 34,400,000 telephones in existence at Dec. 31, 1929, representing an increase of nearly a million and three-quarters on 1928. The data for 32,312,000 of this 34 million odd telephones were obtained from official or authoritative sources. The figures for the remainder have been estimated from official figures for the previous year. The most important states for which estimates have been resorted to are the South American republics, whose systems are operated by numerous private companies, and Japan.

The totals for 1928 and 1929 are distributed amongst continents in the following manner :—

	Dec. 31, 1928. (Thousands.)	Dec. 31, 1929. (Thousands.)
Europe... ..	9,185	9,958
Asia	1,205	1,265
Africa	205	224
North America	20,890	21,706
South America	502	542
Australasia	672	706
	<u>32,659</u>	<u>34,401</u>

An interesting feature of the statistics for 1929 is the steady progress made by Europe. It has increased its total by 773,000 (or 8.4%) as compared with North America's increase of 816,000 (3.9%). It is unlikely that Europe's total for 1930 will be less than 10,500,000, representing an increase of almost exactly 100% on its total for 1920 (5,248,000), the first post war year for which full statistics could be collected. During the same ten years it may be safely estimated that North America will have increased to 22,500,000, or little over 50% on the 14,355,000 telephones it contained in 1920.

The following table shows the number of telephones per 100 inhabitants in all countries with upwards of 100,000 telephones and a density of at least 2% :—

1.—United States	16.9
2.—Canada	14.4
3.—New Zealand	10.8
4.—Denmark	9.4
5.—Sweden	8.3
6.—Australia	8.2
7.—Norway	6.6
8.—Switzerland	6.5
9.—Germany	5.0
10.—Great Britain	4.2
11.—Netherlands	3.7
12.—Finland	3.4
13.—Austria	3.23
14.—Belgium	3.2
15.—France	2.6
16.—Argentina	2.4

I.—EUROPE.

The total number of telephones in Europe increased in 1929 by 773,000 or 8.4%. This is by far the largest increase yet recorded (last year the figure was 644,000—itself a record—or 7.5%).

The largest percentage increases are, as is not unnatural, to be found in those countries whose telephone density has hitherto been poor, or at least below the average of the (telephonically) more developed states; e.g., Spain increased by about 37,000 telephones (24%), Italy by about 52,000 (17%), Belgium by 33,713 (15%), Russia by about 36,000 (12%), and France by 90,515 (over 9%). Of the highly developed countries Switzerland also increased by over 9% and Sweden by nearly 5%, but the percentage increases in Denmark and Norway are only 3 and 2% respectively.

Germany increased by 231,876 and Great Britain by 127,040. These two countries provide more than half the total number of telephones in Europe.

The number of inhabitants per telephone in Europe in 1929 was 51.6. If, however, the comparatively backward States are excluded, it will be found that in the Northern and Western parts of Europe, within an area comprising Scandinavia, Germany, Austria, Switzerland, France, Holland, Belgium, and the British Isles, there were contained 8,219,000 of the 9,958,000 telephones in the continent, or 1 to every 23 inhabitants.

Country.	Population (thousands).	No. of Telephones.		Inhabitants per telephone.
		1928.	1929.	
Austria	6,750	209,470	217,918	30.9
Belgium	7,995	223,066	256,779	31
Bulgaria	5,483	17,091	18,505	295
Czecho-Slovakia	14,353	147,127	157,707	91
Danzig	407	18,405	19,880	20.6
Denmark	3,523	325,596	336,199	10.5
Estonia	1,114	12,692	13,806	80.7
Finland	3,611	116,720	125,772	29
France	40,743	965,519	1,056,034	38.6
Germany	63,100	2,950,430	3,182,306	19.8
Great Britain	45,500	1,759,686	1,886,726	24
Greece	6,131	10,186	13,000	472
Hungary	8,522	93,159	105,148	81
Iceland	94	4,295	4,781	20
Irish Free State	2,975	27,891	28,991	103
Italy	40,425	300,000	352,078	115
Latvia	1,883	33,390	40,996	46
Lithuania	2,000	11,281	13,312	225
Luxemburg	264	10,059	10,710	25
Netherlands	7,832	257,590	284,533	27
Norway	2,810	182,500	186,000	15
Poland	29,589	163,610	178,663	166
Portugal	6,032	29,517	34,558	173
Rumania	17,900	58,398	59,359	300
Russia	147,267	300,000	336,000	438
Serbs, Croats and Slovenes, Kingdom of	12,800	34,283	36,000	359
Spain	22,285	153,400	190,059	117
Sweden	6,120	485,781	509,061	12
Saar Territory	770	21,336	22,655	34
Switzerland	4,069	244,248	268,714	15.1
Turkey	2,000	11,927	12,462	144
Total (including Albania, Gibraltar, &c.	514,300	9,185,000	9,958,000	51.6

With regard to the foregoing table it may be observed that the figures for the population of European countries are those given in the League of Nations handbook 1926.

The number of telephones in Russia includes about 12 to 15 thousand in Asiatic Russia. The figure officially supplied was 331,251 as at the end of September, 1929.

The official information obtained from Norway gave 88,003 stations on the State system at 30th June, 1929, and 73,901 on private systems at 31st December, 1928, and 17,600 other private telephone stations. The total for December, 1929, has been estimated from these figures.

All these 9,958,000 telephones are operated by State departments with the exception of about 1,380,000 private or municipal telephones chiefly made up as follows :—

	Thousand.
Italy	352
Denmark	324
Spain	190
Holland	127
Finland	122.7
Poland	83.6
Norway	76
Portugal	26.6
Turkey in Europe	12.5

There are in addition about 13 thousand railway and private telephones in both Sweden and Czecho-Slovakia; while in Great Britain in addition to the 1,849,181 Post Office telephones there are :—

	Telephones.
Hull (municipal) telephones	16,238
Guernsey States "	4,353
Jersey " "	3,506
Railway and other private tele- phones with exchange facilities	13,448

The 127,000 non-State telephones in Holland are those operated by the municipalities of Amsterdam, Rotterdam, and the Hague. In Poland and Norway, state and private systems claim nearly equal shares, but in the former country the private systems are confined to the large cities. Private systems predominate in Denmark, Finland, and Portugal, and operate almost exclusively in Spain, Italy, and Turkey in Europe.

II.—ASIA.

	Telephones.
Ceylon (8,998)	9,700
China (155,000)	155,000
French Indo China (6,211)	6,500*
Federated Malay States (6,711)	7,478
India (53,689)	56,771
Iraq (1,087)	1,235
Johore and Kedah	1,300
Japan (proper) (834,686)	850,000*
Chosen (35,556)	37,000*
Taiwan (13,526)	14,500*
Quantung (19,270)	20,000*
Saghalien (5,439)	6,000*
Netherlands East Indies (49,398)	53,394
Palestine (3,299)	3,977
Persia (3,827)	4,227
Phillipine Islands (21,416)	23,000*
Siam (3,065)	3,221
Straits Settlements—	
Penang (1,443)	1,766
Malacca (609)	657
Singapore (7,152)	7,568
Turkey in Asia (estimated)	2,000
	<u>1,265,000</u>

The figures in brackets refer to 1928.

* Estimated from last year's official figures.

The population of Asia is estimated at 1,013,000,000, and the number of inhabitants per telephone is 801.

The telephone systems of Asia are chiefly in the hands of State administrations. In China, however (the figures for which are obtained from an American source) about a third of the stations belong to private companies (chiefly in Hong Kong and Shanghai), whilst in British India about 35,000 of the total telephones are in private ownership. Private telephone systems are also found in Persia, the Philippines and Singapore.

III.—AFRICA.

	Telephones.
Algeria (31,021)	35,457
Belgian Congo	998
Dar-es-Salaam (estimated)	600
Egypt (42,885)	45,000*
Kenya and Uganda (2,358)	2,811
Mauritius (784)	812
Madagascar (estimated)	1,600
Morocco (9,500)	10,000*
Mozambique	709
Nigeria and Cameroons	2,500*
S. Rhodesia (3,275)	3,755
South Africa (Union of) (95,452)	101,902
S.W. Africa (estimated)	1,400
Soudan	1,183
Tunis (11,397)	12,000*
Tanganyika	628
Angola, Erythrea, Dahomey, Cyrenaica, &c.	2,500
	<u>224,000</u>

* Estimated on last year's figures.

The estimated population of Africa is 143,000,000. Number of inhabitants per telephone 630.

The telephone systems are operated almost entirely by the respective states. In South Africa there is a municipal system in Durban, while the Mauritius system is worked by a company.

IV.—NORTH AMERICA.

	Population.	No. of Telephones.	Inhabitants per Telephone.
Canada (1,341,219)	9,738	1,406,164	6.9
United States (19,341,000)	118,500	20,067,000	5.9
Mexico (77,971)	14,953	90,000*	166
West Indies—			
Cuba (73,713)	3,569	78,000*	45
Porto Rico (12,296)	1,300	13,000*	100
Jamaica		3,000	—
Haiti (1,903)		2,000*	—
Dominican Republic (2,423)	4,000	3,000*	—
Trinidad		3,000	—
Other places		9,000	—
Central America (23,657)	6,816	24,500*	279
Other N. American places	—	7,000	—
	<u>159,000</u>	<u>21,706,000</u>	<u>7.4</u>

The figures in brackets show the number of telephones in 1928. Those for Mexico, the West Indies and Central America are taken from an American source.

United States.—The total is made up as follows:—

American Telephone and Telegraph and Associated Companies	15,414,000
Independent Companies' stations have connexion with above	4,543,000
Entirely independent	110,000
	<u>20,067,000</u>

It is worthy of remark that the A.T. & T. (Bell) system has gradually obtained a preponderating position. It has now 15.4 millions as against 4.6 million "Independent" telephones (including "Bell connected"). In 1917 the proportions were 5 to 3.6 millions, and in 1907 3.1 to 2.9. The total for the United States represents an increase of 816,000 stations, or 3.7% on the preceding year.

Canada.—The telephone stations are thus distributed:—

	Telephones.
Ontario (chiefly Bell Co.)	620,893
Quebec (" ")	299,855
British Columbia (chiefly B.C. Telephone Co.)	124,475
Saskatchewan (Sask. Govt. and systems in connexion)	115,791
Manitoba (chiefly Govt. system)	79,218
Alberta (" ")	80,602
Nova Scotia (chiefly Maritime T. & T. Co.)	45,256
New Brunswick (chiefly New Brunswick Tel. Co.)	34,006
Prince Edward Island	5,466

The increase on last year was 64,955 or 4.7%.

With the exception of about 155,000 telephones belonging to the Government systems of Saskatchewan, Manitoba, Alberta, and Prince Edward Island, and some 20,000 in Central America and the West Indies, the telephone systems of North America are entirely in the hands of private undertakings.

V.—SOUTH AMERICA.

	Population (thousands).	Telephones.	Population per telephone.
Argentina (239,580)	10,647	250,000	42
Bolivia (2,683)	3,200	3,000	—
Brazil (129,829)	42,637	150,000	284
Chile (42,116)	4,327	45,000	97
Colombia (22,400)	8,000	23,500	—
Ecuador (5,005)	2,500	6,000	—
Peru (13,855)	6,147	15,000	—
Venezuela (14,633)	3,126	16,000	—
Uruguay (28,129)	1,808	29,500	61
Other places	1,678	4,000	—
	<u>84,060</u>	<u>542,000</u>	<u>155</u>

These figures are estimated on figures for 1928 (shown in brackets) obtained from an American source. Progress is usually steady, but, in view of the activities of American companies, may

have been greater in 1929 than estimated above. With the exception of the Government systems in British, Dutch, and French Guiana the telephones in South America are almost exclusively in the hands of numerous private companies. Many of these have been acquired by affiliated companies of the International Telephone and Telegraph Company in New York, but in the Argentine and Brazil there are competing companies of considerable importance.

VI.—AUSTRALASIA.

	Population.	Telephones.	Population per telephone.
Australia (492,666) ...	6,414	518,181	12.3
New Zealand (152,541) ...	1,488	161,323	9.2
Hawaii (22,666) ...	256	23,700	11
Other places ...	—	3,000	—
	9,000	706,000	12.7

Australia.—The increase in telephone development in 1929 was 25,515, or just over 5% on 1928.

The number of telephones in the various states of the Commonwealth is as follows:—

	Telephones.
New South Wales ...	198,674
Victoria ...	159,502
Queensland ...	61,983
South Australia ...	54,834
Western Australia ...	28,685
Tasmania ...	14,504

New Zealand.—The number of telephones increased by 8,500 in 1929 or by 5.5%.

VII.—TELEPHONE DEVELOPMENT OF LARGE CITIES.

	Telephones.	(Per 100 population.
1.—New York ...	1,811,410	27.1
2.—Chicago ...	987,891	29.8
3.—London (Telephone Area) ...	661,977	8.9
London (Administrative County) ...	487,927	10.9
4.—Berlin ...	515,175	12.8
5.—Philadelphia ...	448,875	21.7
6.—Boston ...	440,228	23.5
7.—Los Angeles ...	383,979	27.4
8.—Paris ...	367,980	12.2
9.—Detroit ...	351,597	20.1
10.—San Francisco ...	262,019	34.0
11.—Cleveland ...	251,642	21.7
12.—Pittsburg ...	229,135	23.5
13.—St. Louis ...	222,413	20.0
14.—Toronto ...	201,419	28.4
15.—Montreal ...	187,985	19.3
16.—Hamburg-Altona ...	173,828	13.7
17.—Cincinnati ...	167,432	25.5
18.—Washington ...	163,343	30.5
19.—Milwaukee ...	155,209	22.2
20.—Kansas-City ...	149,969	23.1
21.—Vienna ...	148,432	8
22.—Copenhagen ...	136,528	22.6
23.—Tokyo (1928) ...	135,619	5.8
24.—Buenos Aires (1928) ...	135,037	6.6
25.—Baltimore ...	134,378	16.4
26.—Minneapolis ...	131,989	26.3
27.—Buffalo ...	131,400	19.6
28.—Stockholm ...	126,529	30.1
29.—Oakland, Cal. ...	126,450	23.7
30.—Seattle, Wash. ...	124,504	29.5
31.—Sydney, N.S.W. ...	118,269	10.8
32.—Newark, N.J. ...	109,106	17.9

VIII.—CITIES WITH UPWARDS OF 10,000 TELEPHONES.

United States.—(The largest of these are included in the foregoing table) ...

Germany.—(Berlin 515,175, Hamburg 173,828, Munich 75,621, Leipzig 69,985, Cologne 68,967, Frankfurt-Main 65,606, Dresden 62,393, Stuttgart 47,042, Düsseldorf 46,281, Breslau 42,779, Hanover 37,826, Nuremberg 36,924, Bremen 32,752; Essen, Chemnitz, Duisburg, Königsberg, Mannheim, Dortmund, Magdeburg, Stettin, over 20,000; Elberfeld, Halle, Barmen, Kassel, M. Gladbach, Karlsruhe, Crefeld, Wiesbaden, Aachen, Kiel, Brunswick, Erfurt, Mainz, Bielefeld, Bochum, over 10,000)

Great Britain.—(London area 661,977, Manchester 59,338, Liverpool 55,173, Glasgow 54,293, Birmingham 48,932, Edinburgh, 26,670, Leeds 20,701, Newcastle-on-Tyne 18,134; Sheffield, Bristol, and Bradford, over 17,000, Hull 16,238, Belfast and Nottingham over 14,000, Leicester, Brighton, and Bournemouth over 11,000)

Canada.—(Toronto 201,419, Montreal 187,985, Vancouver and Winnipeg about 50,000, Ottawa 37,750, Hamilton, Quebec, Windsor (Ont.), Calgary, London (Ont.), Victoria (B.C.), Edmonton, Halifax (N.S.), St. John (New Brunswick) and Regina, between 10 and 30,000)

France.—(Paris 367,980, Lyons 27,667, Marseilles 23,894, Bordeaux 15,924, Lille 14,088, Strassbourg 13,222, Nice 12,876, Roubaix-Tourcoing 12,648)

Japan.—(Tokyo 135,619, Osaka 93,218, Kyoto 32,745, Nagoya 26,975, Kobe 27,303, Yokohama 14,305—all 1928)

Australia.—(Sydney 118,269, Melbourne 96,181, Adelaide 32,035, Brisbane 24,580, Perth 16,466)

Switzerland.—(Zurich 37,864, Basle 154,983, Geneva 20,132, Berne 17,191, Lausanne 10,924)

Italy.—(Rome 32,528, Milan 56,315, Turin 22,817, Genoa 18,949, Naples 11,597)

China.—(Peking about 30,000, Shanghai 28,000, Hong Kong 11,937, Tientsin 10,000)

Netherlands.—(Amsterdam 47,048, Rotterdam 40,158, The Hague 39,846)

Belgium.—(Brussels 85,396, Antwerp 34,408, Liège 17,673)

Sweden.—(Stockholm 126,529, Göteborg 35,376, Malmö 17,454)

New Zealand.—(Auckland 20,413, Christchurch 12,311, Wellington 19,505)

Czecho-Slovakia.—(Prague 38,868, Brno (Brunn) 10,269)

Egypt.—(Cairo over 16,000, Alexandria 12,000)

India.—(Calcutta 15,583, Bombay 10,000)

Norway.—(Oslo 45,318, Bergen 10,652)

Spain.—(Madrid 35,230, Barcelona 32,848)

South Africa.—(Cape Town 16,787, Johannesburg 22,360)

Russia.—(Moscow 70,247, Leningrad 63,104)

Poland.—(Warsaw 46,623, Lodz 11,018)

Algeria.—(Algiers, 11,214)

Argentina.—(Buenos Aires 135,037)

Austria.—(Vienna 148,432)

Brazil.—(Rio de Janeiro 41,933)

Chile.—(Santiago, 12,187)

Cuba.—(Havana 50,623)

Danzig.—(Danzig 12,224)

Denmark.—(Copenhagen and suburbs 143,977)

Finland.—(Helsingfors 31,148)

Hungary.—(Budapest 60,539)

Ireland.—(Dublin 16,324)

Latvia.—(Riga 13,322)

Mexico.—(Mexico City 44,335)

Netherlands Indies.—(Batavia 10,529)

Phillipine Islands.—(Manila 14,747)

Portugal.—(Lisbon 20,222)

Rumania.—(Bucarest 15,280)

Saar District.—(Saarbrücken 12,705)

Turkey.—(Constantinople 12,462)

Uruguay.—(Monte Video 16,674)

Of these 311 cities 178 are in North America, 102 in Europe, 14 in Asia, 8 in Australasia, 5 in Africa, and 4 in South America.

The number of telephones in the British Empire in 1929 was approximately 4,227,000:—

	Thousands.
Great Britain and Ireland ...	1,915.7
India ...	55
Ceylon ...	9.7
Malaya ...	16
Hong Kong ...	12
South Africa ...	101.9
Other African Colonies ...	12.2
Canada ...	1,406
West Indies ...	12
British Guiana ...	2
Australia ...	518.2
New Zealand ...	161
Other places ...	5

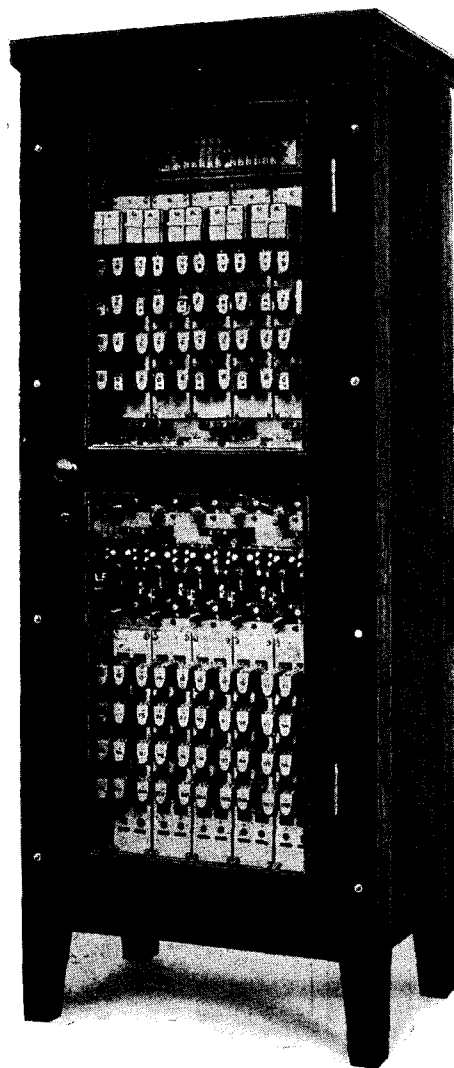
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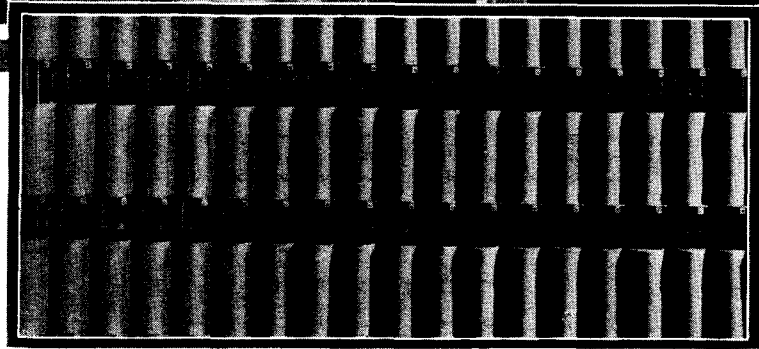
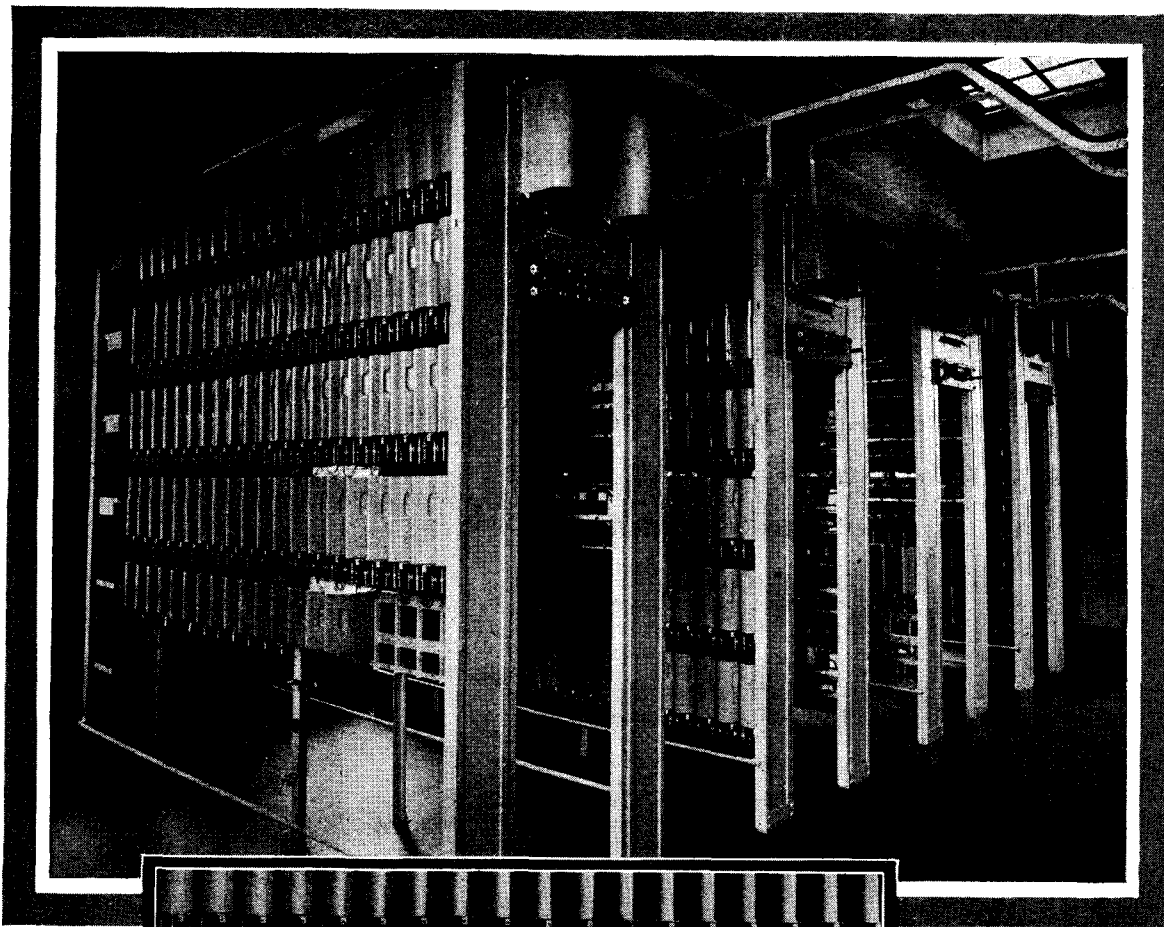
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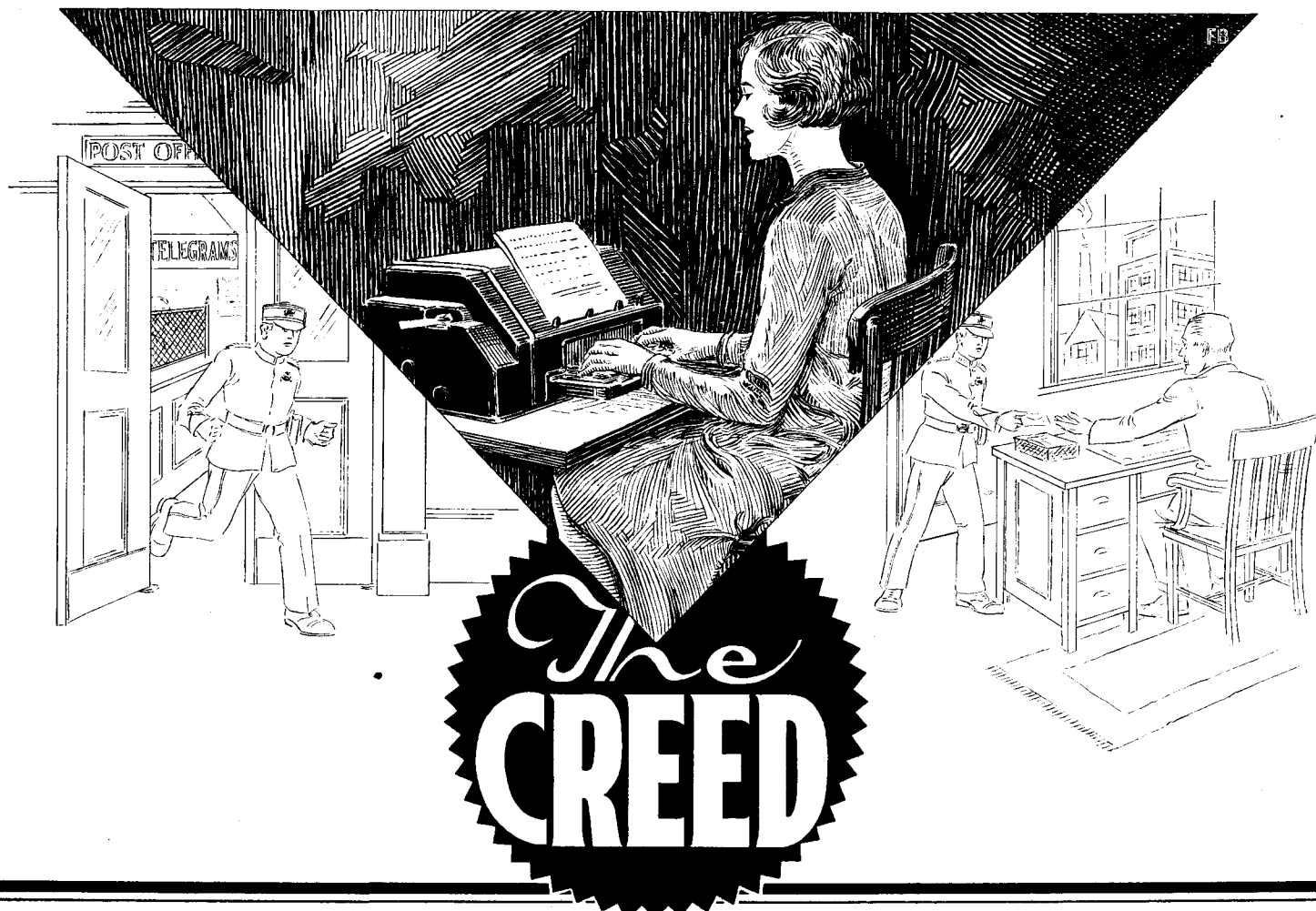
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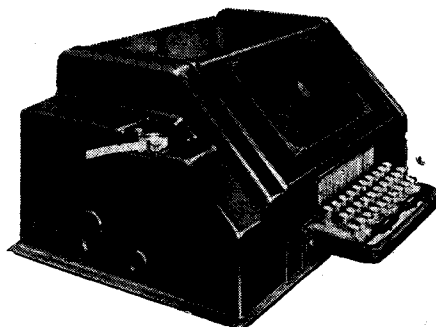
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TELEGRAPHIC MEMORABILIA.

WITH a monthly journal there is need to be well ahead of Father Time. Thus it happens that the traditional Christmas card, with its snow-clad waits chafing their hands beneath the iced farmhouse windows, seems somewhat out of harmony with the actual meteorological conditions of a glorious sunny November day. Indeed, one reluctantly comes in from the garden to take up pen instead of spade and fork, though not reluctantly does the writer wish his many friends, colleagues, and correspondents A MERRY CHRISTMAS AND A HAPPY NEW YEAR. To many I am indebted for help, suggestions, and last, but not least, encouragement. Kindly appreciative words float in to me from home and abroad throughout the year, and especially during 1930 has this been the case. To all, then, my sincere and reverent benison!

Our managing editor, I recently discovered, was at one time a contributor to the humorous weeklies, *Moonshine* and *Judy*, mentioned at the foot of last month's *Memorabilia*. This is a doubly interesting fact, in that it also places him among the "Old Stagers!"

Companies.—The Wireless Telegraph Co. of South Africa Ltd. is now to be known as "Overseas Communications of South Africa," a change due to the amalgamation of the cable and wireless interests. The company will operate the cable in addition to the wireless circuit, and its licence has been extended to Dec. 31, 1944. The annual report for year ended June 30 shows a net profit of nearly 33%. *The Telephone Co. of Pernambuco's* report for financial year ended 1929 carries forward a debit balance of £7,569 after providing for debenture interest. *The American T. & T. Co.* reports an increase of income for the first nine months of 1930 of just over two million dollars as compared with last year's same period. *The Western Union Telegraph Co.* for the same period shows a decrease in gross revenue of more than nine million dollars.

Obituary.—The more senior of the Cable Room staff, C.T.O., will easily recall the cheerful figure and disposition of Mr. Thomas John McManis, Asst. Supt. II, formerly of the Submarine Telegraph Co., of Threadneedle Street, and then Throgmorton Avenue, who retired during the war upon reaching the age-limit. For years "Mac" was a prominent figure at almost every function where song and merriment were the order of the day and always was it "within the merits of becoming mirth." And now in his 74th year he has passed over quietly and calmly to join the choir invisible, for on Nov. 2 he fell asleep, and on the 8th was laid to rest in Sutton Road Cemetery, Prittlewell. Messrs. C. J. Faunch, H. E. Dauncey, S. Pearce, F. J. Furby, E. J. Kessels, and W. F. Jackson, representing both the Inland and Foreign telegraph sections.

Personal.—The sadness of parting with old associates is at times materially lightened by gracious acts on the part of colleagues on behalf of widow and/or orphans of the deceased. A case in point has just come to light where Sam Pearce has secured substantial assistance and help to the relict and family of a brother officer. All friends of the Ex-Asst. Controller Cable Room, Mr. A. Tapley, will tender sincerest sympathy in this his second serious accident since his retirement.

Countries.—ARABIA.—Reuter's agency states that as the result of a contract concluded with a British firm at Mecca recently, Islam's Holy City will, in due course, be placed in wireless communication with every European capital. Since the accession of King Ibn Saud to the Hedjaz throne, the number of wireless stations has doubled, and the present intention is to extend them so that the whole of Arabia, including Nejd, will be connected with the outside world. There were only a small number of wireless stations in the days of the Turkish regime, although it must be admitted that at the time of that regime there were other large areas than those under Turkish control which were less adequately supplied than is the case with them to-day. AUSTRALIA.—The total number of receiving licences in use in the Commonwealth on Aug. 31 last

was 335,037, the increase of 16,616 for the month being a record. In Victoria 147,180 licences were in use and 120,673 in New South Wales. BELGIUM.—The newly-formed Institut National Belge de Radio diffusion is the central executive authority for broadcasting in Belgium. M. van Soust de Borkenfeldt, the former director of Radio Belgique, has been appointed director-general of the new body. The new telegraph cable, of which mention has already been made in these columns, between the Belgian submarine cable station of La Panne, South America, and the States of the Latin Union, was duly inaugurated on Oct. 22. Telegrams were exchanged between the King of the Belgians and the King of Italy and the heads of the States interested. BRAZIL.—According to Reuter's Trade Service at Sao Paulo the State Government has granted a concession for another broadcasting station to be erected on the top of the Martinelli building (a structure of 24 stories), making in all three stations operating from this same city. CANADA.—On the 4th ult. a facsimile hand-written telegram addressed to Mr. R. B. Bennett (the Canadian premier then in this country) was transmitted by wireless on the occasion of the opening of the "Produced in Canada" Exhibition, at Montreal. *The Electrician* (London, England) most admirably reproduced this historically interesting document in its issue of Nov. 14. The National Research Council of Canada has established an associate committee on radio research under the chairmanship of Dr. A. S. Eve, of McGill University. It will be similar to the boards functioning in Britain, Australia, and other countries, and will work in close co-operation with the radio division of the Department of Marine. FRANCE.—The Radio Agen station, which was destroyed by floods last March, is to be reconstructed. The station at Beziers is to increase its power from 0.6 kw. to 10 kw. (aerial) at an early date, according to *World Radio*, and this same authority says that Radio-Viters—to be removed to Romainville—will increase its power to 2 kw. and to 20 kw. next spring. It is intended to use the latter transmitter exclusively for experimental television. Two private broadcasting stations are also to be removed from Paris, viz., Radio-Paris and Radio-Petit Parisien, to reduce mutual interference of the Parisian stations. It is also mooted in French radio circles that there are Budget proposals which contemplate additional taxes on wireless sets in the shape of the taxation of valves and spare parts! GERMANY.—The German police have issued instructions, says *The Electrical Review*, that all persons using radio apparatus which causes interference will be prosecuted. From a private source it is learnt that the German authorities are also placing restrictions on the sale of sets that have not been made non-interfering. Reuter's Cologne agency states that with a view to effecting an all-round reduction in salaries and wages, the whole of the staff of the *Westdeutschen Rundfunk* (the second largest broadcasting organisation in Germany), has been given notice of dismissal, although the company earns considerable profits. GREAT BRITAIN.—The Communication Committee of the recent Imperial Conference after discussing the advisability of establishing a radio-telephone transmitter in England to broadcast a daily general and news programme to the whole of the British Empire, concluded unanimously that such a project would prove of great benefit if carried out. *Rapid Extension of Underground telegraph and telephone lines.*—Overhead telegraph and telephone lines have rapidly disappeared during the last twenty years in Great Britain. In 1914 there were 947,392 miles of overhead as compared with 1,926,743 miles of underground. In 1920 there were 1,063,372 miles overhead with 3,657,285 miles of underground. From 1920 to March 1930 only 204,674 miles of overhead were put up, whereas the total underground mileage had reached the huge figure of 7,344,400. HUNGARY.—Some 60 foreign delegates attended the meetings of the International Radio Union which commenced on Oct. 13 and terminated on Oct. 17 at Budapest, under the chairmanship of Vice-Admiral Carpendale (Great Britain). The Union will hold its next meetings at the beginning of February at Semmering (Austria) and at the end of June at Stresa (Italy). INDIA.—From the last annual report of the Indian Posts and Telegraphs Department, among many other interesting items, the following should prove specially so to the majority of readers:—(a) "Systematic observation of short-wave transmission between Calcutta, Rangoon,

and Madras were instituted (during 1929) and valuable information regarding wavelengths and working conditions were obtained; (b) Wireless communication was also satisfactorily maintained with Penang and Sabang, via Rangoon, and with Kashgar, through Peshawar. (c) Wireless was brought into use on various occasions when the normal land and/or cable lines were interrupted between Madras and Colombo. (d) There was only one direction-finding station in full operation during the year, that at Karachi (Malir), but a number of ships utilised signals from Diamond Island and other land stations to obtain bearings by wireless with their own direction-finding sets. It is worthy of note that apparatus was ordered for four direction-finding installations in connexion with the inland air service between Karachi and Rangoon. ITALY.—It is recorded by the *Wireless World* that from the 31st of the present month, a Royal Decree, postponed to permit the manufacture of sufficient apparatus, will require all Italian non-passenger ships of less than 1,600 tons gross to carry wireless apparatus capable of receiving the Rome weather forecasts within a radius of 625 miles. The Italian Minister of Communications has presented a Bill to Parliament containing new regulations for the installation and use of electro-radio apparatus. The proposed new law seeks to prevent the clandestine installation of amateur stations, says *The Electrical Review*, while it is also an attempt to eliminate interference which they cause with the regular broadcasting stations. JAPAN.—Several extensions of the radio-telegraph services have been made and new stations are being built, or are under consideration, in Japan, says a report from officers at H.M. Embassy, Tokio. Radio-telephone communication is said to be still in the experimental stage. Japan has eight broadcasting stations, one of which has a 3-kw. Telefunken equipment, while all the others are 10 kw. stations, equipped with apparatus supplied by Marconi Wireless Telegraph Company or Standard Telephones and Cables. "Outside Japan proper," proceeds the report, "there are broadcasting stations at Toihoku, Seoul, Dairen, and Mukden. Japanese-made picture-transmission apparatus has been installed at Tokyo and Osaka, and a public service between these cities was to be opened in July last." PERSIA.—"The Minister of Posts and Telegraphs officially inaugurated, on Oct. 26, on behalf of the Shah," says a Reuter communication from Teheran, "direct short-wave radio-telegraph communication between Persia and Europe and Persia and Iraq, in addition to the already existing long-wave installation communicating with Russia, Turkey, and Syria. The Telegraph Administration of Great Britain, France and Germany, courteously assisted with the final tests, which proved very successful, with the three wireless stations of the countries just named. Complimentary telegrams were exchanged and the Persian Minister of Posts referred with some natural pride to the fact that, under the aegis of the present Shah, Persia now owned 'an installation which conformed to the latest technical progress.'" POLAND.—Reuter's Trade Service informs us from Warsaw that plans are complete for the erection at the end of the present month of a high-power broadcasting station near Warsaw. The site of this new station is at Raszyn, twenty kilometres from the city, the total estimated cost is 10,000,000 zloty. Other stations are to be erected in the provinces. SIAM.—The Siamese Government, states a reliable authority, has noted the growing popularity of wireless sets in Bangkok, and is looking forward to broadcasting as a valuable instrument of education. The revenue is apparently a promising one, as it is hoped that the tax on sets will enable improved programmes to be diffused. SIERRA LEONE.—*The Electrical Review* states that the Administrative Report for 1929 on the Sierra Leone Railway (W. Africa) includes a telegraph and telephone section. From this we learn that the total mileage of communication lines increased from 37.5 miles to 1,903, chiefly due to additional telephone lines in Freetown. In addition to 76 train-staff instruments and 40 telegraph instruments, 12 telephones were in use for telegraph service. SWEDEN.—Time was when even reputable electrical engineers could scarcely be convinced of the reality of inductive disturbance as a detrimental factor in the working of telegraph circuit, overhead, underground, or sub-aqueous. The advent of the oscillograph somewhere about the first decade of the present century made clearly visible the heavy distortion forces at work.

Quite recently representatives of the telegraph administrations in Czecho-Slovakia, Denmark, Finland, France, Germany, Great Britain, together with delegates of electrical manufacturing firms in England, Germany, and Switzerland, recently paid a visit to Sweden, accompanied by the Secretary of the International Telegraph Union, in order to ascertain in the region of Skillingary inductive effects between parallel conductors. Measurements of this nature form part of the working programme of the Commission Mixte Internationale, with which a large number of European telephone administrations co-operate. U.S.A.—The R.C.A. Communications, Inc., has been granted permission by the Federal Radio Commission to erect eleven new radio transmitters at Rocky Point, N.Y., states the *T. & T. Age*. Each of the new transmitters will have a maximum power of 80,000 watts. A number of definite points of communication are named, thus:—Warsaw, Oslo, Angora, San Juan, Havana, Amsterdam, Prague, Cartago, Bogota, Paris, Brussels, and Beirut. It is deeply interesting to note, however, that in each case the permission adds "and with other stations with which the R.C.A. Communications, Inc., stations are licensed to communicate by the Federal Radio Commission." In granting these permits the Commission allows the use of channels above 6,000 kcs., on the condition that they will not interfere with the services of foreign countries.

Time's Defeat.—"Time cannot take

My three great jewels from the crown of life;
Love, sympathy, and faith.—*Ella W. Wilcox.*

J. J. T.

FOR OUR ADVERTISERS.

ALL enquiries should be addressed to the Department of Overseas Trade, 35, Old Queen Street, London, S.W., quoting reference number in all cases. Supplies, &c., required by:—

Uruguay.—Montevideo. Dec. 5. State Electricity Supply Works 150,000 metres lead-covered rubber-insulated conductors (A.X. 10479). Also Dec. 9, 450,000 metres rubber-insulated cables and wire (A.X. 10476). *New Zealand.*—Wellington, Posts and Telegraphs. Dec. 9. Supply telephone transformers (A.X. 10370). Also, Wellington, same department. Dec. 10. Supply switchboard cable (A.X. 10371). Also, Wellington, same department. Dec. 12, two conductor switchboard panel 151/2630 AX 10502. Also Wellington, same department. Dec. 15. Supply of transmitters (A.X. 10362). *Australia.*—Melbourne, Jan. 6, 1931. Supply submarine cable (Sched. No. C. 656) (A.X. 10309). Same date, place, supply indicators A.X. 10403. Same place, department. Jan. 13, 1931. Supply terminal strips. Ref. A.X. 10465. *New Zealand.*—P. & T. Wellington. Jan. 19. Electric lamps and condensers A.X. 10446. *Australia.*—Melbourne, Feb. 3. Supply telephone exchange power boards A.X. 10466.

Confidential Reports.—No. 1.—On market for radio apparatus in Siam, furnished by H.M. Consul-General at Bangkok, has been issued to firms whose names are entered on Special Register of the Department of Overseas Trade. United Kingdom firms should apply to address as at head of this column, quoting Reference B.X. 6740, if desirous of receiving copy of this and/or similar reports.

No. 2.—On market for wireless apparatus in Argentina from information furnished by the Commercial Counsellor, H.M.'s Embassy, Buenos Aires (Ref. B.X. 6762).

C.T.O. NOTES.

Promotions.—Miss E. J. L. Schirges, Assistant Supervisor Telegraphs to Supervisor Telegraphs; Mr. F. P. Gwyther, Telegraphist to Overseer.

Retirements.—Messrs. G. H. Major and G. Mason, Assistant Superintendents; A. Hiscock, A. J. Stevens, Overseers; F. W. Searle and E. Essex, Telegraphists. Misses F. M. Grigsby, Supervisor; E. A. M. Wheeler, I. Wright and C. F. Hughesdon, Assistant Supervisors.

C.T.O. Art Society.—The C.T.O. Art Society held their Annual Show between Nov. 11 and 14. Mr. F. Emmanuel officiated as judge in the Art Section and Mr. W. L. Shand, F.R.P.S., acting in a like capacity in the Photographic Section.

LONG DISTANCE TELEPHONY.

J. F. DARBY (*Headquarters Traffic Section*).

(I.)

It is proposed in these articles to cover aspects of long distance working relating to operating methods, technical aids and organisation, rather than questions of extension of the service (from the point of view of distance) or modifications of tariffs.

Consideration of means of improving the trunk service, particularly the inland service, has assumed considerable importance and urgency from three points of view:

- (a) The progress which has been made in local and short distance working by the introduction of automatic equipment, the use of mechanical aids, replacement of obsolete equipment, improved signalling, &c.

These improvements invite a comparison with the conditions which obtain on the long distance service.

- (b) With the development of ultra long distance telephone channels serving the various continents of the world, it becomes imperative to provide a trunk service within the zone served by an international tête-de-ligne, such that international connexions will not suffer delay, through slow switching at the terminal têtes-de-ligne. The policy involved is analogous to that which is followed on the inland trunk service, i.e., the maximum use is obtained from the trunk circuits by the provision, on a no-delay basis, of trunk junctions and similar circuits at the trunk terminals for completing long distance connexions.

- (c) The general speeding up which is taking place in all industries, including communications and transport services.

Progress in long distance working can be made in three ways—speed, reliability, and increased facilities, and at the present time the biggest telephone administrations of the world are devoting themselves to the solution of these problems.

The conditions of the long distance telephone service in America have recently been studied by a Post Office Commission, and it was clear that very considerable progress has been attained during recent years; details of the arrangements in force will be dealt with later. It might, however, at this stage, be mentioned that the average time taken to set up a long distance telephone call (omitting short distance trunk traffic dealt with on a no-delay basis) was reduced from 13.6 minutes in 1920 to 2.4 minutes in 1929. Including short distance (no-delay) trunk traffic, the speed of connexion was reduced from 3.8 minutes in 1922 to 1.2 minutes in 1929.

In France definite steps have been taken for speeding up long distance connexions by the introduction of the "direct traffic" method on certain routes. Some of the routes in question are of a length such as would be worked on the normal junction basis in this country. On the other hand, the system is being introduced on routes on which delay working would be the normal busy-hour condition.

In Great Britain the question has been continuously under study, and definite steps in the direction of progress have from time to time been taken. In this connexion no-delay working, as at present developed on a junction basis, has been pushed to its economical limit, and routes as long as 50 miles in some instances have been converted to this class of working. The most outstanding of these are, perhaps, the Glasgow-Edinburgh route, the Liverpool-Manchester route, which have been worked on a no-delay basis since 1914. Apart from special cases, however, where the community of interest and the volume of traffic warrant special treatment,

the economical limit for no-delay working has been found to be approximately 30-35 miles. In America the limit for no-delay working (known as A-B working) is understood to be approximately the same distance as in Great Britain. At the present time 85% of the total trunk traffic of Great Britain is dealt with on a no-delay basis at all hours of the day.

The London Toll Exchange, which was planned before but delayed in consequence of the war, was opened in 1921, and the area around London served on a no-delay basis was considerably extended. This scheme represented, at that time, the greatest advance in Europe in speedy working over routes up to 30 miles in length, and "no-delay" cross-area connexions up to 80 or 90 miles were made possible as the scheme was developed.

A new principle was introduced, that of requiring subscribers to ask for an intermediate type of long distance exchange, viz., "Toll," and circuits from local exchanges to positions at the Toll exchange were provided for recording and completing calls to the Toll area while the subscriber remained at the telephone; a multiple of the outgoing toll circuits was provided in front of the recording and completing operators at the Toll Exchange. It is important to remember that these circuits were provided on a junction basis. ("Junction basis" implies the provision of a number of circuits is such that the chances of finding all circuits engaged when testing for an outlet is 1 in 100.) The arrangements were fully justified by the results and the foundation was laid for an efficient and economical service.

A further step to improve the trunk service was taken this year by the decision to provide additional circuits to admit of an average delay of not more than 15 minutes in the busy hour, on all routes in this country—a certain number of the main routes, up to that time, being subject to an average delay of 30 minutes, as a standard. It was considered that the earning capacity of the trunk circuits would admit of the cost of the additional circuits involved.

Apart, however, from the question of the provision of additional circuits, either directly to eliminate or reduce delay, other means must be found for increasing the efficiency of long distance working, and it will be by improved operating methods, technical aids, and better organisation that these problems will be solved.

As regards the operating methods, it is mentioned that the basic system of operating long distance routes is to record subscribers' demands on tickets on a two-number basis (calling and called subscriber's number) at record positions, or their equivalent, and to release the calling subscribers. The tickets, or the details on the tickets, are passed to other operators who attempt to set up the calls and undertake control. These operators are each given a definite number of circuits to control. The tickets are lined up in code turn and the traffic disposed of as rapidly as possible. The efficiency of the operating is judged from the average delay and the paid time obtained over the route in question. The standard for average delay has already been mentioned; the paid time varies from 30-40 minutes during the busy hour, according to the number of circuits controlled.

A modification of this method of operating was introduced in 1913 under the title of "special control" working. Under this system the trunk circuits are multiplied in front of the recording operator; facilities are thus provided which enable the recording operator to complete the call while holding the subscriber at the telephone with the receiver at the ear, assuming that there is an outlet available to the required distant office. The controlling operator in such cases is normally an A operator at a local exchange. If during certain periods of the day (as is usually the case), the circuits are inadequate to set up the connexions on demand, the tickets are passed to an operator at a special control position for treatment on lines similar to the normal method of delay working. This method was adopted on the shorter routes worked on a delay basis and confined, until recently, to those routes with automatic signalling facilities, i.e., the controlling operator receives a supervisory signal from both the calling and called subscriber.

In 1929, Special Control working was extended to routes normally worked on a delay basis in the London Trunk Exchange in an area around London embracing nearly the whole of the London zone, and circuits worked on a generator signalling basis were included in this scheme. This modification was effected by the transfer of the routes in question from the London Trunk to the Toll exchange.

There were two salient features of this experiment; one was the improved service which resulted (mainly in the direction of speed of setting up connexions); the other was that no material increase in the number of trunk circuits in use was necessary apart from additions made to meet growth of traffic.

Certain minor defects were brought to light, mainly in connexion with timing, multi-switched calls and mis-circulated traffic—these points are all capable of solution and are being dealt with.

The study made of American methods showed that the present system in force in the United States is, basically, the method in force in the London Toll area—that is, the record positions are equipped for both recording and completing calls, and the system is, in consequence, known as the *combined line and recording* (C.L.R.) method of working. It will, of course, be recognised that this initial effort on generator signalling delay routes in this country, is no way comparable with the reorganisation which has been carried out in the United States—having regard to the areas and distances involved, and the transmission and routing questions which arise. The problem of inland long distance working in this country is comparable more with the organisation of the telephone communications of a single American State.

(To be continued.)

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at September 30, 1930, was 1,931,227, representing an increase of 7,821 on the total at the end of August.

The number of stations working at September 30 in London, England and Wales (excluding London), Scotland and Northern Ireland was as follows:—

	No. of Stations at Sept. 30, 1930.	
London	692,797	
England and Wales (excluding London) ...	1,044,931	
Scotland	169,447	
Northern Ireland	24,052	

The growth for the month of September is summarised below:—

	London.	Provinces.
Telephone Stations—		
Total at Sept. 30	692,797	1,238,430
Net increase for month	2,397	5,424
Residence Rate Subscribers—		
Total	172,989	269,746
Net increase	1,163	1,688
Call Office Stations (including Kiosks)—		
Total	6,410	26,609
Net increase	77	172
Kiosks—		
Total	2,028	7,046
Net increase	48	121
Rural Party Line Stations—		
Total	—	9,680
Rural Railway Stations connected with Exchange System—		
Total	17	1,833
Net increase	—	18

The total number of inland trunk calls dealt with in July, 1930 (the latest statistics available) was 10,938,507, representing an increase of 285,074, or 2.7% over July, 1929.

Outgoing international calls numbered 46,797 and incoming international calls 49,965, as compared with 46,774 and 49,742 respectively in July, 1929.

Further progress was made during the month of October with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Macaulay (automatic).

PROVINCES—Allenheads, Arreton, Burton Pidsea, Culgaith, Durisdeer, Gt. Withingham, Hamstall Ridware, Hemswell, Humberston, Hemingborough, Langtoft, Llangranog, Nesscliffe, Samlesbury, St. Mabyn, Seaforde, Selborne, Shaugh Prior, Snape, Sutton Courtenay, Tarland, Tetford, Ythanwells (all rural automatic); Merrylee (Glasgow),

and among the more important exchanges extended were:—

PROVINCES—Beauchief (Sheffield) (automatic), Birmingham (South), Egham, Godalming, Rustington, Stirling.

During the month the following additions to the main underground system were completed and brought into use:—

Hanley—Uttoxeter,	Dundee—Aberdeen,
Reading—Newbury,	Polegate—Eastfield,
Portsmouth—Petersfield,	Oxford—Banbury,
Shrewsbury—Wrexham,	London—Gallows Corner
Southampton—Basingstoke,	(section of London—Southend No. 2 cable),

while 76 new overhead trunk circuits were completed, and 79 additional circuits were provided by means of spare wires in underground cables.

CORRESPONDENCE.

“HOW TO DEVELOP THE TELEPHONE SERVICE.”

TO THE EDITOR OF “THE TELEGRAPH AND TELEPHONE JOURNAL.”

Dear Sir,—The contention is made in Class I Contract Officer's letter published in your October issue that it should be obvious that the more residential subscribers that can be obtained the more necessary it is for the residential non-subscribers to have the service for social and other purposes (not business), but are private residence lines rented for purely social and other purposes (not business) to the extent that is generally imagined? Do not the following examples of private residence connexions suggest that the business factor predominates and develops before the social factor? Many people find it necessary, for instance, to have the telephone in their private houses to keep in touch with their business in case of illness, &c. Many business and public men rent private residence lines primarily in their business and public associations. How many corporation officials, railway officials and departmental chiefs of business undertakings have telephones at their private residences in connexion with their employment and at the firms' expense? Even the department finds it necessary to provide certain of its officials with exchange lines to their private residences, and some outside firms actually pay the business rate for lines to the private addresses of their employees. Does not all this, therefore, suggest that the social aspect of the telephone for private residences may be stressed to excess. Regarding the reference to “small shopkeepers,” I suggest that they develop the necessity for the telephone for their own business convenience before any question of “self preservation” because their customers have become subscribers, arises. (What is the position if their customers are already using the many call offices and kiosks?) After all, do adequate grounds exist for believing that they are less progressive than their customers, and are they not likely to become the more prosperous?

Arising out of the question whether sufficient use is made of the 2-party line rate of £4 per annum, is this rate sufficiently attractive in comparison with the exclusive rate of £5 10s. per annum? However, if it is a sufficiently attractive proposition both to the public and to the Department, then a good point appears to have been made that the field should be extended to include premises under one mile from the exchange. Is it likewise necessary to continue to debar a farmer under half a mile from the exchange from renting the rural party line service which is available to his neighbour over half a mile from the exchange?

Regarding the suggested guaranteed message rate as an alternative for private residences, does not its business counterpart already exist in the shape of the guaranteed call office on private premises? In the past railway companies, for instance, have given a guarantee of this nature in respect of their rural stations in preference to renting a circuit. A required guarantee of £8 per annum covers 960 calls at 2d., approximately 2.6 calls per day, whilst a rental circuit covering the same number of calls would cost £11 per annum. Your correspondent claims that his suggested guaranteed message rate for private residences would have a tremendous attraction to private residents who will not look at existing rates. Can he fairly claim

that this optimistic outlook is borne out in the case of its business counterpart? Some business non-subscribers and ceasing subscribers offer the department the use of their premises for call office purposes.

Does the alternative offer of a guarantee call office appeal to any extent? I suggest that Class I Contract Officer is straining credulity in asserting that there are private residents who can see sufficient use to guarantee 3 calls a day who will not look at existing telephone rates. Do not the outside advocates of the "No Rental" service really mean that the department should install the apparatus and simply charge for the message use of the line without guarantee? Does not the guaranteed amount practically reintroduce the rental factor? The guaranteed amount would have to be paid whether any use was made of the line or not. However, is there any strong reason to suppose that the rate suggested by Class I Contract Officer does not, in fact, already exist in a more favourable form. After all, private residents whose own personal calling rate was below the guaranteed number are quite likely to develop the call office instinct and request the fitting of the "Sign."

Regarding Class I Contract Officer's final suggestion that promotion to the rank of Contract Manager or Contract Officer Class I should be given to those officers who show outstanding ability in salesmanship, in the earliest portion of his comments he stated that "anyone who has had a long experience of the Contract Department knows that it is far easier to obtain orders to-day than it was 20 years ago. The same thing will no doubt be true of the future." Does not this, therefore, suggest that salesmanship is a diminishing factor and that the persuasive make up of the canvasser is being superseded. However, what grounds has Class I Contract Officer for supposing that his suggestion is not already taken into account?—Yours faithfully,
"CLERICAL OFFICER."

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—In the current issue, "Contract Officer, Class I" says: "Contract Managers, above all persons, should be subscribers." Why?

Residence telephone service does not increase a Contract Manager's business efficiency to any marked degree. He must attend at his office, interview his staff, supervise the work, meet the public, travel, and generally carry out the dozen-and-one duties which require, every day, the personal touch. A man running his own business may, however, find the telephone service at his house of great assistance to that business; it is our job to convince him to that end. Similarly, a salaried official's usefulness to his employers may be considerably enhanced by his being accessible by telephone at his house; in the majority of such cases the employers pay.

But these considerations do not apply in the case of a Contract Manager, who surely can claim that his guiding consideration must be the need or convenience of telephone service to his domestic conditions. It is not reasonable to suggest that because he is trying to push telephones he should have a telephone himself at his own cost. If the underlying inference is the advertising value—the psychological effect—of the seller himself using the goods he offers, I agree; but surely it is for the employer to bear the cost of advertising.

(I am not arguing for free telephones at Contract Managers' houses.)

The great majority of our private residence subscribers are people who have become convinced—either of themselves or through our Contract Officers—that a telephone in the home is, for one reason or another, a "good thing" from a domestic point of view. I am one myself. I became one simply because I desired, in certain circumstances, the safeguard and convenience of telephone service, and not at all because I happen to be—

Oct. 18, 1930.

A CONTRACT MANAGER.

THE TELEPHONE CONTRACT OFFICER.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—Now that other grades in the Post Office are eligible, under certain conditions, for transfer to the position of Contract Officer in the Telephone Service without loss of establishment, an increasing interest in the work of that officer has been aroused.

For the benefit of the uninitiated it may not, therefore, be out of place to record here an idea of the duties and an outline of the qualities which are desirable in a Contract Officer.

A Contract Officer is employed on the commercial side of the Telephone Service. His duties lie "on the road," in the manner of a commercial traveller or salesman, his primary object being to secure new subscribers by interviewing and canvassing all classes of the community. He also calls on existing subscribers to canvass for additional facilities, and on those who have given notice to discontinue the service, with a view to obtaining withdrawals of such notices.

From the foregoing it will be seen that the development of the telephone service is largely dependent upon the canvassing efforts and ability of Contract Officers. This being the case, the question arises as to the type of individual most suited for the work.

The best qualities that help toward success as a salesman are natural to some men; and unless they are already ingrained in a man's nature, no amount of work or study will enable him to develop them. But these qualities sometimes take a little time to discover, so it does not follow that a man is unfitted for the work because his first few weeks or months are not very successful. This may mean that he has not yet awakened to his own abilities, or that he has not given his good work time to bring results.

A good Contract Officer's work is cumulative in effect; the second call on a potential subscriber is easier than the first, and is more likely to bring business. Some of the most successful officers were probably weak in results on their earlier rounds of calls. It is this fact that makes it difficult for the beginner to know if he is going to be a success or failure until time has told him.

But there are certain indications which can assist everyone to form a judgment on his fitness for the work, and these signs are apparent before even the first journey is made.

Let us take the first and most important of these. This is the ability to "get on" with people; the power of being companionable and of making friends. The young man who has this quality will generally make a good Contract Officer. Half his difficulties are over before he starts. He will get an interview where others fail, and he will get business.

Next in value to being interested in one's fellow-men is being interested in affairs. The man who has many themes, or who, better still, can speedily join in other people's pet subjects, is the right man for the job. Go where he will he has something to talk about, and that is a good introduction.

Enthusiasm is another valuable quality. The man who can be enthusiastic will doubtless meet with many who will not see eye-to-eye with his opinions, but the bright, optimistic, hopeful nature always tells. On the other hand, the man who has discovered that industry is "played out" and that trade is "rotten" will have a poor reception when he starts off on his daily round.

Again, a topical spirit makes a good salesman. He who is keenly interested in to-day, and the questions of to-day, and who carries this notion of crisp up-to-dateness into his business life, will "get there" on the road.

These, then, are some of the needful qualities to be looked for in a successful Contract Officer, and the young man without them should hesitate before attempting to adopt the career.

Oct. 27, 1930.

R. G. R.

[Other letters unavoidably held over.]

BIRMINGHAM NOTES.

ANOTHER step towards the completion of the work necessary for the introduction of the automatic system took place on Nov. 8 last.

All police and fire lines were changed throughout the district to standard numbers, "Q" and "O" not being available on the dial. Quinton and Oldbury were changed to Woodgate and Broadwell respectively and given 4-digit numbers.

480 lines were transferred from Central to Midland and 200 lines from Northern to Birchfields (hypothetical), while several smaller groups were transferred, owing to correction of areas. In all 1,163 changes were made, and it is pleasing to record that no complaints have been received.

Civil Service Sports Association (Birmingham Area).—A most successful dance was held at the Palais-de-Dance, Birmingham, on the evening of Nov. 12. Upwards of 700 members and friends spent a really enjoyable evening.

Birmingham Telephone Society.—The second of the meetings arranged in connexion with the winter programme of the Society was held on Thursday, Nov. 13, under the chairmanship of the Postmaster-Surveyor (Lt.-Col. Brain), when a paper was given by Mr. L. G. Allen, Traffic Superintendent, Class II, on the Birmingham Automatic Scheme and its effect upon operating and procedure. The interest displayed by the members was reflected in the large attendance—at least 600 members being present—and in the discussion which followed.

After the serious side of the business had been disposed of the evening was given up to an entertainment by members of the Central and Midland Exchanges, under the direction of the Misses Cockbill and Pope, followed by a few dances. We were pleased to have with us several members of the Headquarters Traffic Staff.

The next meeting will be held early in December, when the paper will be given by Mr. E. T. Vallance, Assistant Traffic Superintendent.

READING DISTRICT NOTES.

THE promotion of Mr. Vaughan, Traffic Superintendent, Class I, to District Manager, Sheffield, is the third such promotion from the Reading District within three years; a series of events which probably constitutes a record for a provincial district.

An interesting function took place on Oct. 31, when representatives of all sections of the District Manager's Office gathered to wish Mr. Vaughan farewell on his departure to take up the new duties at Sheffield. Mr. Frame, Traffic Superintendent, Class II, briefly sketched his long personal and official associations with Mr. Vaughan and drew attention to his marked ability. Mr. Drescher, who represented the Chief Clerk and his staff, and Mr. Coulsell, Contract Manager, also spoke in appreciative terms. Mr. Moorhouse, District Manager, on behalf of the staff, in a brief and well-chosen speech, then asked Mr. Vaughan to accept a suit case, fountain pen and stand and a petrol lighter. Mr. Vaughan suitably replied. He left with best wishes of the whole staff.

THE SOCIAL EFFECTS OF WIRELESS.

A LECTURE with the above title was delivered by Dr. C. Delisle Burns, M.A., D.Litt., on Sunday, Nov. 2, at Conway Hall, Red Lion Square, W.C., at one of the usual Sunday morning services of the South Place Ethical Society.

Dr. Delisle Burns is the well known writer and lecturer on political and social philosophy, and is at present Stevenson Lecturer in Citizenship at the University of Glasgow. He has also held the post of Lecturer on Logic, Social Philosophy, and kindred subjects at the University of London, while during the periods of reconstruction after the war he filled responsible positions in the Ministry of Labour, the Ministry of Reconstruction, and the Labour Office of the League of Nations. As is to be expected of a scholar of his accomplishments, his lectures are always well-informed, happily expressed, and aptly illustrated, and he possesses that modernity of outlook which leads him to prefer an up-to-date theme upon which to discourse.

Dealing first with the economic effects of wireless, Dr. Burns, in his lecture, noted that the demand for wireless apparatus gave employment to thousands of workers, many of them women, and was an illustration of the transfer of operatives from heavy and laborious work to skilled occupation, from "essential" services to "luxury" services—a change which, in the lecturer's opinion, marked an advance in civilisation. In his view, too, the old joy of craftsmanship, absent from operatives engaged in routine, repetitive and mass production, was being revived among workers employed in the construction of the finer, more intricate, and therefore more interesting processes of making wireless equipments.

Of the effects of wireless on the consumer, that is the "listener-in," he drew attention to the following: It afforded an entirely new form of entertainment which encouraged the exercise of the "home-keeping" habit. Dr. Burns was careful, however, to contrast this present-day habit with that of the 19th century, when the home was regarded either as a lair into which people retired to sleep, or as a place in which the adult male exercised a domestic despotism. The "listener-in," besides getting entertainment, received a great deal of instruction in the form of news, broadcast from hour to hour, of views expressed in the form of discussions between authoritative exponents, and much specialised information imparted in the form of lectures. Although the effects of all this was remarkable enough in Europe and America, where the dissemination of news was speedy, copious, and dependable, it was not so startling as in countries like Russia, India, and China, where, previously, both news and information were belated, meagre, and unreliable. One very important aspect of the effect on the three last-named countries, and on other similar countries where the vast majority of the inhabitants can neither read nor write, is that by means of the broadcast spoken word, information is now imparted of which under old conditions these people would have remained entirely and permanently ignorant.

Many modifications in social and international relationships were taking place as a result of the wireless habit. On the social side, the broadcasting of matter to all classes, irrespective of caste, is having a levelling effect, and this is emphasised by the employment of a form and pronunciation of language, which besides being appropriate, is generally acceptable. Of its effect on international relationships, Dr. Burns pointed out that a very large percentage of broadcast matter, emanating as it did from British and U.S.A. stations, was expressed in the English tongue. This in time would lead to a wider and perhaps universal knowledge of that language, but whether "American English," "Oxford English," or "Broadcast English" would prevail, the lecturer was not prepared to hazard a conjecture. Probably also, but to a less extent, a more general knowledge of other languages and other points of view would be the rule, and the lecturer ventured the hope that from knowledge would come understanding, and from understanding appreciation. Finally, Dr. Burns emphasised that the advance of social morality depended, not upon commentaries on vague platitudes, but upon

understanding peoples and problems in detail; and this involved, among other things, the destruction of "localism." He looked upon wireless as an important instrument in that process, and, as such, a tangible contribution to the building of a new civilised society.
H. B. R.

THE G.P.O. PLAYERS.

VERSATILITY is one of the many praiseworthy characteristics of the G.P.O. Players, and the production of one of the farces of Pinero's middle period is quite in accordance with their tradition. "Dandy Dick" was originally produced in the early 'nineties, and is an agreeable, eminently actable and amusing piece with many of the defects and merits of that period. It differs considerably in quality and character from the riper products of Pinero's art, and makes its appeal largely by its light and amusing style and by the sidelights it throws on the manners and customs of those not too distant days. It was treated frankly as a costume piece and not as a present-day comedy, and it may be said at once that it was most skilfully produced by Mr. Hodgson-Bentley, who (of course, with the indispensable aid of an excellent caste) secured the flavour of the early 'nineties to the full. Mr. Cyril Leigh, as a typically mildly-stern, erringly-upright stage dean, and Mr. Pilkington as his comic-solemn butler, provided two capital character studies—though perhaps Mr. Leigh was not always as distinct as he might have been. Mr. Jack Scott in a most convincing make-up, ably filled the part of a sporting baronet, whilst Georgiana Tidman, the horsey, good-hearted and sensible sister of the dean (a type dear to Victorian novelists) was admirably portrayed by Miss Beatrice Cowan.

The play abounded, in fact, in "character" rôles (as becomed a pure-bred farce) and Mr. Sellars revelled in the rich part of the constable Noah Topping, ably seconded by Miss Dorothy Smith as his wife. Then, again, the two hussar officers (Mr. Gartland excelling as Major Tarver) were sketched in fine comedy vein. When all misunderstandings are cleared away, errors forgiven, and lovers—sympathetically grouped together—are united, the final curtain, falling on Major Tarver lustily braying "Come into the Garden, Maud," to the tinkling of his fiancée on the piano, was a delight.

The dean's two daughters, Salome and Sheba (Miss Henniker and Miss Law) looked charming in their period costumes. The "bustle" will find few apologists in these days, but Miss Henniker in particular carried off her not too voluminous skirt with grace and distinction. I suppose it is a stage convention that young ladies of "bustle" era must walk with a kind of toddle-tottering gait, but I seem to remember—and the bustle was not quite extinct in my youth—that the girls of that day walked as naturally as they do at present.

"Dandy Dick" was preceded by a one-act-play, "Stress," written by Laurence Gartland and Gerald Storr, two well-known acting members of the Society. Joyce Grandison, possessed of a particularly undesirable husband, has at length decided to leave him. There is the faithful admirer (James Bellamy) who cannot stand by and see her ill used, and there is the sudden and unexpected return of the husband at the moment at which his wife makes up her mind to forsake her home. So far we have a familiar and well worn theme, but the authors impart an original note into the play, when the husband shams sudden illness in order to regain his wife's sympathy. While she is gone to fetch some sal-volatile, Grandison essays to demonstrate to a friend how naturally he can feign a collapse. This time, however, the collapse is real (presumably the penalty of a disordered life), and the wife returns to find him dead. The play is a very promising piece of work. The principal burden of the play was admirably sustained by Miss Kathleen Emery, Mr. Pilkington, and Mr. Gartland.

It remains to be added that Mr. Will Harrison's orchestra provided well varied interludes during the evening.

W. H. G.

LIVERPOOL NOTES.

Who's that calling? 2.10 a.m.: Calling signal glows. "Number, please." Bang! crash!! bang!!! Such unusual noises heard by the night operator seemed to indicate that the office (an ordinary business one which is shut up at night) was being burgled. The night operator very promptly reported to the police and an immediate investigation was made. The police found that an extension to a stable connected with the business was switched through at night and that one of the horses got loose, knocking the telephone off a desk, releasing the rest and leaving the transmitter open to transmit the weird noises heard by the night operator. The commendable action of the night operator enabled the mysterious happenings to be cleared up at once.

At one of our meetings with the telephonists, discussion on speeds developed with a question as to whether the difference between 5 and 6 seconds in the average answer was appreciated generally. Following up the train of thought Mr. Gauntlett told a subsequent gathering that a second saved on the average speed of answer in the four largest exchanges in the Liverpool District represented a time value of 46 hours a day.

On Nov. 3, Mr. R. A. David, whose recent promotion was announced in these notes last October, was the guest of his erstwhile colleagues at a Hot Pot (Lancashire) supper at the St. George's Restaurant, Liverpool. The occasion was a presentation to him of a writing bureau from the Liverpool Traffic Staff (which, on this occasion, included the District Manager, Mr. W. E. Gauntlett).

The chair was taken by Mr. Staite and the proceedings included speeches by the Chairman, Mr. S. J. Swinnerton, Mr. S. N. Aickin, Mr. Tomlinson and Mr. C. H. Hill, of the Engineering Department.

Songs and musical items were given by Messrs. Woodward, Holt, Davidson, Moseley, Carroll and Johnson.

Appropriately a Promotion Board interlude was staged by Messrs. Geill, Davies and Tomlinson. Various members of the company present were called before the Board and put through it for the benefit of the "younger members" who have not yet been through the real thing.

The presentation was made by Mr. Gauntlett, who referred to the many good qualities of our guest and late colleague, and asked him to accept the present from the Liverpool Traffic Staff as a token of their good wishes for his future success in life. Mr. David responded.

During the course of the evening, telegrams, more or less genuine, were handed in at intervals from the Governor of the Isle of Man, Mr. Burstall, Pasha of Egypt, the precincts of Canterbury and others, all of which added to the hilarity of a typical Liverpool Traffic Staff gathering.

Open Letter to Leeds.—Dear Leeds,—Are you pulling our leg? How is this for an enquiry?

"I want the address of a lady who lives in this neighbourhood. I don't know her name or the name of the street, but her husband's name is Tom."

I may say this one was satisfied and the two parties brought together.

We always thought "Ilkla Moor" was in Lanes. Sorry!!!—Reciprocally, Liverpool.

Parties of scholars are continuing to visit our exchanges and, generally speaking, take an intelligent interest in the working of the exchange. As the scholars come from girls' as well as from boys' schools, it may well happen that interest in the business as a career may be aroused in some cases, both operating and engineering.

The Child Welfare Movement has been well supported by the operating and clerical staff of the Liverpool District Telephone Service during the past month.

Several interesting and well attended functions, viz., fancy dress dances, socials, concerts, whist drives, &c., have taken place, and very enjoyable evenings have been spent, the arrangements for which reflected the greatest credit on all concerned.

The amount collected from the District Manager's Office and Telephone exchanges within the past month is approximately £60. The staff have been untiring in their efforts to raise money for this worthy cause and it is hoped that with other similar social gatherings, weekly subscriptions and other schemes, their efforts will be rewarded with a decided increase in the total amounts before the close of the fund.

An approximate total of £500 has been collected to date from the combined efforts of all branches of the Liverpool Post Office Service in aid of the Child Welfare Organisation.

Mr. W. Edwards, Assistant Traffic Superintendent, has been transferred for 6 months to the Birmingham District to assist in the Traffic Section there, which is very busy on account of the approaching changes from manual to automatic working.

LEEDS DISTRICT NOTES.

OUR "distinguished visitors" book was again in evidence when we had the honour of a visit, on Oct. 29, from Mr. Leech (Director of Telegraphs and Telephones), Mr. Simon (Asst. Sec., Telegraph Branch), and Mr. Parsons (Asst. Sec., B. & S.B.), to inspect the Model Instrument Room and the Leeds Exchange Switchroom.

Staff Dance.—The first social function of the winter season was held at the Metropole Hotel, Leeds, on Saturday, Nov. 1, when almost 300 members of the Telephone Staff and their friends tripped the "light fantastic toe" to the strains of the Stein Song and other popular melodies. Bradford, Skipton, Otley, and many other outlying exchanges sent their contingents, and the assembly was graced by the presence of Lieut.-Col. Jayne (Postmaster-Surveyor) and Mrs. Jayne, and Mr. Bates (District Manager), Mr. Bownass (Asst. Postmaster) and Mrs. Bownass. The Social Committee, and especially Mr. C. A. Atkinson, the indefatigable M.C., are to be congratulated on the success of their efforts.

Exhibition of P.O. Engineering Films.—In March, 1927, Mr. J. Shea, M.I.E.E., was the first lecturer at Leeds to make use of films as a means of illustrating a lecture, appreciating the fact that the showing of films illustrating the Department's methods of carrying out work had a very high educational value, and thus anticipating the policy which has now been adopted by the Department in arranging for the showing of films as part of the education of workmen.

The first exhibition of official films was made on Oct. 14, 1930, at the Carlton Cinema, Leeds, when Mr. Alby of the Engineer-in-Chief's Office, exhibited the following official films:—

- Jointing L.C. Cable; Wire Twisting;
- Pole Hole Excavation;
- (a) Bar and spoon,
- (b) Iwan Auger;
- Pole Shifting; Pole-lifting Jacks;
- (a) Lifting pole out of ground and placing in new hole;
- (b) Pole-lifting jacks and trench method;
- Recovering poles by pole-lifting jacks.

It was a pleasing feature of the show to know that five of the films had been "shot" in this district, and also distinctly amusing to see some of our colleagues seeing themselves as others see them.

The jointing film was a triumph for those responsible for shooting, as the "slow motion" made it quite clear how it should be done and also revealed any unnecessary hand and body movements made by the different workmen in the operation.

As a means of education, not only to those who have been at the game a long time, but to beginners, such a film has a very high value.

There was a great duel between Bar and Spoon versus Auger, and the audience at the conclusion of this film were uncertain as to whom they should give the verdict for efficiency, but ultimately it was the general feeling that a combination of the two methods might eventually be the solution.

Pole-lifting jacks and their antics were amazing, and the older engineers rubbed their eyes, wondering into what fresh world they had been dropped. In the "good old times" they admired the precision of the stepped pole-hole, and the graceful and stately manner of erecting the pole! Now, up comes Bar and Spoon-Augur, like bogies of a dark world, and ere one has time to step out the distance as of yore, the hole is dug, the pole is in position, and the earth rammed—all ready for the next position!

Rush! Rush!! Rush!!! you say, but it is the reverse; there is no rush, it is simply taking the "L" out of labour, and obviously a step in the direction all work is taking, that is, that man does the directing, and the tools—the children of man's brain—do all the hard muscle straining work.

Mr. Alby as film director was ideal, inasmuch as he knew the pitfalls and slippery places, and when any member of the audience ventured thereon, he gently led into safe positions.

The meeting was most enjoyable, and, it is hoped, the forerunner of many others.

Presentation to Mr. C. A. Atkinson.—Mr. Atkinson, Asst. Traffic Supt., who has been transferred to Birmingham District, was presented by his friends in the Traffic Section with a silk dressing gown. Mr. Murray (Traffic Superintendent), in making the presentation, referred to the special flair which Mr. Atkinson possesses for making a success of social functions, and expressed the sentiments of the staff in wishing him every success and happiness in his new sphere.

These Women!—The heading is not ours; and we hasten to add that—as the following extract from the *Yorkshire Observer* shows—it does not refer to the Telephone Operating Staff:—

"One does not mind occasionally on answering the telephone being met with the reply, 'Sorry, wrong number,' but what of the feelings of a person who is apparently permanently attached to a particular wrong-number 'fiend'?"

"Such is my experience (writes a Leeds correspondent), and, moreover, this telephone user—a woman—rings up my house very early in the morning with the object of ordering commodities from a local tradesman.

"The telephone system is the automatic one, and I have discovered that the tradesman's number differs in one figure from mine. Sheer carelessness in dialling, of course. The other morning when interrupted, as usual, at breakfast, I ventured a gentle remonstrance, to be met with the typically feminine illogical reply: 'Well, I have never heard your voice before, and I don't want to hear it again.'

"I was so flabbergasted that by the time I had thought of a suitable reply my opponent had rung off."

DINNER AND PRESENTATION TO MR. J. R. M. ELLIOTT, M.I.E.E.

A MEMORABLE gathering representative of all ranks in the Northern Engineering District met on Saturday, Oct. 11, at the County Hotel, Newcastle-on-Tyne, to attend the first annual dinner of the district and to take official leave of Mr. J. R. M. Elliott, M.I.E.E., the retiring Superintending Engineer. Covers were laid for 220 diners, and the assembly comprised colleagues from all parts of the district, from the neighbouring English and Scotch districts and many retired officers. The gathering, therefore, took on the nature of a grand re-union. The function was not only unique in the history of the Northern District on account of its size and representative nature, but the occasion marked the first visit of the Engineer-in-Chief, Sir T. F. Purves, to a local social gathering. The high esteem and affectionate regard in which the Engineer-in-Chief is held was markedly reflected in the warmth and wholeheartedness of the welcome with which he was received.

In addition to Sir Thomas Purves and Mr. Elliott, the guests of the evening included Mr. F. Ferguson, Postmaster-Surveyor, Newcastle-on-Tyne, Mr. J. D. Taylor, Superintending Engineer, Edinburgh, Mr. J. M. Shackleton, Superintending Engineer, Preston, Mr. J. W. Atkinson, Superintending Engineer, Leeds, Mr. C. Whillis, Superintending Engineer, Glasgow, Mr. J. D. W. Stewart, District Manager, Newcastle, Mr. Tattersall, Asst. Superintending Engineer, Edinburgh, Mr. J. K. A. Nicholson, B.B.C., Newcastle, Mr. J. B. Purves, G.E.C., Newcastle, and Mr. E. C. Brooks. Standard Telephones & Cables, Ltd.

After dinner, and in answer to a call from the Chairman, Sir Thos. Purves proposed the health of Mr. Elliott, in a felicitous speech, backed by an apparently inexhaustible repertoire of stories. Mr. Elliott, said Sir Thomas, had fully maintained the status, dignity, and reputation of the Department in a great industrial area. He had been a loyal, zealous and efficient officer and he retired with the love, esteem and regard of his staff. Sir Thomas wished him many years of happiness and good health in the rest which he had so well earned.

After speeches by Mr. A. Cook, Mr. Jas. A. Motyer and Mr. J. B. Croney, Mr. F. G. C. Baldwin, M.I.E.E., before calling upon Sir Thomas to present Mr. Elliott with a solid silver tea and coffee service and a handbag for Mrs. Elliott, took the opportunity of saying that in his relationship with Mr. Elliott they had never been at cross purposes, their acquaintance had been both intimate and cordial; this was probably due to Mr. Elliott's equable temperament. The handbag was being presented to Mrs. Elliott to mark the gratitude of the staff for the many kindnesses and uniform consideration which she had always shown to the staff.

In acknowledging the gifts of the staff, which were presented by Sir Thomas, Mr. Elliott, who was received with musical honours, said that no words could express adequately his gratitude for the tokens of kindness as represented by the presents. They would be his most treasured possessions and would always serve to remind him of many happy days in the service and particularly during the past 18 years in the Northern District. The Engineer-in-Chief's action in travelling a distance of 300 miles after a strenuous week's work was characteristic of his nature. The success of the district had been due to the spirit of "camaraderie" which permeated the staff. If the country were searched no force more competent and more loyal could be met with. The clerical staff he had always held in the highest regard, and examining officers from the headquarters staffs had repeatedly complimented him upon the clerical work. For the engineering officers he had nothing but the highest praise. Mr. Baldwin had been a tower of strength. He had always been a pleasant assistant, a very hard worker, and all his work had been thoroughly and efficiently done. The local centre of the I.P.O.E.E. had been particularly successful and had enjoyed the distinction of 100% membership for several years, due largely to the enthusiasm and untiring energy of the local secretary, Mr. A. C. Smith.

The workmen of the district were second to none in the country. According to the costing figures issued periodically, the Northern District holds an unassailable position. Since 1924 the district had consistently held the premier position and this performance was a matter of pride. This position was achieved by close and constant supervision and by encouragement and tuition of the staff on one hand and on the other by conscientious workmen backed by a spirit of loyalty towards their supervisors. It was a great pleasure to know that he had so many good friends in the service and particularly in the Northern District. He expressed the hope that each one might enjoy the best of health and that the future might bring the best of luck.

NEWCASTLE-ON-TYNE AND DISTRICT SERVICE NOTES.

Bowls: *Newcastle-upon-Tyne Post Office Bowling Club.*—The 18th playing season of the club (which was formed in 1908) has now been completed. In the League tournament eight clubs competed, and the final positions were as follow: Telephones 25 points, Office of Works 22, Writing Staff 20, Postmen 17, Engineers 10, Telegraphs 7, Sorting Office 6, Engineers' Sports Club 5. The champions played 14, won 12, lost 1, drew 1 and had scores of 836 for and 634 against.

The championship was in doubt until the final match of the season, when the Telephones defeated the Office of Works, and won the trophy for the fifth time.

The Two Bowl Championship was also won by one of the Telephone team, Mr. R. W. Wilson, who, although he lost an arm in the war, has been the winner of the cup four times—the last five years.

The honours in the Four Bowl Handicap fell to Mr. Fred Atherton, of the Engineers' Sports Club, who was successful in the final against Mr. J. Dowson, of the Sorting Office.

It is regretted that the Post Office team, generally well in the running for honours in the Tyneside League, had their worst season on record. Fourteen games were played, of which seven were won and seven lost. Application for membership of the League next year is being made by a team of superannuated members of the Newcastle Post Office.



[Photo by Frank & Son, Gateshead.]

MISS A. BEATTIE. MISS R. FARQUHARSON.

Swimming: *Newcastle-on-Tyne Exchange Swimming Club.*—The Third Annual Gala of the above club was held in the New Bridge Street Baths on Sept. 19, before a large, interested and enthusiastic audience. Mr. J. D. W. Stewart, president of the club, presented the club trophies and men's prizes. Alderman Sir A. W. Lambert was also present, officiating as a judge.

One of the most popular events was the Club Championship; the shield for which was regained by Miss A. Beattie, winner of 1928, from Miss R. Farquharson.

The silver cup for graceful swimming was retained for the third year by Miss R. Farquharson.

Graceful diving had yet another holder in Miss V. McEvoy.

Two events open to male members of the Post Office were a 50 yds. scratch race, won by Mr. H. Drewson, Engineers, and a squadron race, hotly contested, going to the Engineers.

The Exchange swimming team, consisting of Misses Farquharson, McEvoy and Beattie, competed in an open squadron race held by Sunderland A.S.C. at the Corporation Baths, Wednesday, Sept. 24, and were successful in gaining first place.

There was also a ladies' open handicap in which they came in first in their respective heats, Miss Beattie gained second place in the final.

Staff.—On the occasion of Miss L. Robinson, Clerical Officer, leaving to take up her new duties as Supervisor of the Fees Section in the Gloucester District a representative gathering of all sections of the District Manager's staff was held in the Conference Room at Telephone House, on Oct. 17, to bid her farewell.

Mr. J. D. W. Stewart (District Manager) presented Miss Robinson with a silver tea service on behalf of the staff and a Westminster chiming clock on behalf of the Social Committee.

It was due to Miss Robinson's efforts that the first Social and Dance in the history of the Newcastle Telephone Staff was held in 1926, and so successful did it prove that many happy evenings have since been spent during the winter months.

Miss Robinson carries away with her our sincere good wishes for her future success.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of October resulted in a net gain of 5,520 stations.

Exhibitions.—The Motor Show for 1930 recorded a further advance both in exhibitors and the number of lines provided.

There were 580 exhibitors this year, compared with 525 last year, and 433 lines were fitted against 386 last year.

In addition 2 private wires, 5 temporary circuits and 6 extensions were provided.

A new feature of this year's show was the special section devoted to motor boats, made possible by the extension of Olympia, with the result that the number of exhibitors was higher than in any previous year.

For the Cycle and Motor Cycle Show which followed the Motor Show, the number of lines provided was 101, and there were 202 exhibitors.

The following extract is taken from a letter received from a Sydenham subscriber:—

"I would like to take this opportunity to thank you for the service you have given me, especially as I realise the arrangement as a little unorthodox. One reads quite a lot of tripe in the daily press about the lack of enterprise of the G.P.O., but the L.T.S. strikes me as being second to none, and I have seen *all* the big cities in the world.—Thank you."

L.T.S. Sports Association.

Rowing Section.—The completion of the Civil Service Boat House at Chiswick enables this section now to officiate actively. Miss Sanders, of Accounts Section AN(c) is organising a Ladies' Office Club, and Miss Osler, of Holborn, will be pleased to hear from any of the Exchange Staff who desire to form a club.

The annual charges are:—

For Women's Clubs—

£1 for first-year members under 21.
£1 5s. for all other members.

For Men's Clubs—

£1 for first year under 21.
£1 10s. for second year under 21.
£2 for all other members.

The boat-house is fully equipped with hot and cold shower baths, drying rooms and heated dressing rooms.

Full details are being circulated to all exchanges and office sections.

"Are You There?"

"Is that the Staff of the L.T.S.?"

"One moment, please, you are through to 'Personal Calls' from Sanatoria at Ashford, Benenden, Bournemouth, Cranham, Haslemere and Ventnor, Brompton Hospital and home addresses."

"Will you please accept and convey my thanks for the beautiful presents received at Christmas?"

"My Christmas present from the L.T.S. Committee arrived safely. The cake was a beauty and the cigarettes are of the kind I like best. I am very grateful to all subscribers."

"To you and all concerned, please accept my best thanks for the gifts I received this Christmas. Perhaps my gratitude can be best explained if I tell you that no thought was more remote in my mind than that I should hear from any of my old associates in the London Telephone Service."

"We enjoyed every moment of the concert. I cannot express just how we felt. We had been boasting for weeks about the L.T.S. concerts: the last two days have proved that we did not say half enough about it."

Dear Colleagues,—It is thought that the foregoing extracts from letters received from our colleagues who have had the misfortune to contract that dread disease, consumption, would prove to be of interest.

In thanking you all sincerely for your generosity in subscribing to the Sanatorium Concert Fund and by being members of the Post Office Sanatorium Society, providing the means by which Christmas presents are sent to those receiving treatment, I ask you to endeavour to persuade your colleagues to follow your good example and help the Committee of the L.T.S. Constituency to reach the goal of its ambition—100% membership.—Yours faithfully,
M. M. WORTH, Secretary.

Holy Cross Sanatorium, Haslemere.

The series of concerts provided by the staff of the L.T.S. commenced on Saturday, Oct. 18, with an entertainment at the above hospital. As it was our first visit the choice of programme presented difficulties. Miss Worth, the Concert Director, however, decided to put on the last Benenden programme. This proved a wise selection.

Songs, duets and quartettes by Miss Nellie Beare, Miss Margaret Worth and Messrs. Hugh Williams and Arthur Hider were well received. Mr. Charles Conyers' ventriloquial sketches, aided and abetted by his little friend, "Willie Winks," kept the audience, particularly the young people, in roars of laughter. Mr. Arthur Samuels, another entertainer, featured humorous choruses, and when listening to the singing of the staff and patients one could hardly believe that we were at a sanatorium.

Other items that call for special references were Miss Beare's rendering of the Bach-Gounod "Ave Maria," Mr. Hider's singing of "Father O'Flynn" and the excellent accompaniments of Miss Janet Rivers.

Before singing "Auld Lang Syne" the Padre, in calling for a round of applause for the artistes, referred to the gratitude they all felt to the staff of the L.T.S. for providing such an excellent concert and for the cigarettes, sweets, &c. He added that although this was the first visit of the L.T.S. party he hoped it would not be the last.

Miss Worth, in replying, stated that visits of this kind were a real pleasure to the artistes, who seemed to enjoy themselves as much as the audience.

An assurance was given that another concert would be given at a future date.

London Telephonists' Society.

The second meeting of the session, held on Nov. 7, was devoted to a lantern lecture, entitled "A Tour Round the Strower Works, Liverpool."

Evidently the lecture was eagerly looked forward to, as a large gathering assembled in the Hall of the Institute of Electrical Engineers, where the meeting was held.

In introducing the lecturer Dr. Turney, the Chairman referred to the fact that the Automatic Telephone Manufacturing Company had entered wholeheartedly into the proposal to give such a lecture to the London Telephonists' Society, and that the slides, which were to be shown, had been especially prepared for the purpose.

Dr. Turney, by means of these lantern slides, took his audience for a lightning trip through the extensive works of the Automatic Telephone Manufacturing Company, explaining points of interest in connexion with each of the scenes depicted. It proved, as was to be anticipated, an extremely interesting journey, in the course of which we were introduced to the many types of machinery in use for making the various components of automatic telephone apparatus, and the ingenious means adopted for the rapid assembling of such apparatus. As if the manufacture of automatic telephone equipment was not sufficient to employ the entire resources of one firm, Dr. Turney showed us pictures of other activities of the Automatic Telephone Manufacturing Company, amongst which were the manufacture of signalling devices for mines and illuminated automatic signals for controlling street traffic.

The impression left on one's mind was that the Company's factory was a very highly and efficiently organised concern, where not only are the various portions of automatic telephone apparatus very skilfully produced, but where exhaustive laboratory and working tests are constantly carried out to ensure the efficiency of the completed equipment.

Upon the conclusion of the lecture, Miss McDonald aptly expressed to the lecturer the appreciation of the meeting for a most interesting evening, in which she was supported by Mr. Dive, who associated himself with the previous speaker's remarks.

The Committee of the Society, who are to be complimented on the success of the meeting, should all feel gratified with the splendid attendance of members, all of whom, be it noted, remained to the close, a testimony to the interest created by the lecture.

The next meeting of the Society will be held on Dec. 5, at the Y.M.C.A. Hall, Aldersgate Street, when Mr. Savidge, of the London General Omnibus Co. Ltd., and Mr. Buchanan-Taylor, of Messrs. J. Lyons & Co., Ltd., will be the speakers. An interesting evening is assured and a well-filled hall is anticipated. Please reserve the date and come.



MISS N. TEMME.

L.T.S. Swimming Association.

The L.T.S. Swimming Association held a highly successful and enjoyable dance at Australia House on Nov. 14. The event was associated with the presentation of the prizes (made by Miss Cox, Superintendent of the Exchange Staff) to the winners of the events chronicled in our last issue. As the names of the prizewinners were then given in detail, it is unnecessary to repeat them, but it may be mentioned that Miss House and Miss McBirnie made what seemed quite frequent appearances on the platform to the accompaniment of enthusiastic cheers. Short speeches by Miss Cox and Mr. E. A. Pounds (the founder of the Association) received a hearty welcome, and then dancing was resumed. The enormous attendance was a testimony to the hard work of the Hon. Sec., Miss N. Temme, who organised the dance.

Personalia.**Resignations on Account of Marriage.**

Assistant Supervisor, Class I.

Miss F. Powell, of Grangewood.

Telephonists.

Miss E. E. Barnes, of Beckenham.	Miss M. W. Green, of London Wall.
" E. E. Pawley, of Toll B.	" M. Moore, of Monument.
" E. M. Weller, of Mayfair.	" A. L. Macey, of Museum.
" M. Ketch, of Clerkenwell.	" E. E. Inns, of Park.
" P. M. Blandin, of Paddington.	" S. A. J. Faulkner, of Riverside.
" F. E. Wythe, of Paddington.	" J. E. Roberts, of Royal.
" I. G. Selkirk, of Paddington.	" M. A. Austin, of Tandem.
" E. R. Auvache, of Central.	" M. A. Atkinson, of Toll A.
" E. E. Wood, of Central.	" D. Adnams, of Trunk.
" I. B. M. Maynard, of Hayes.	" W. V. Marshall, of Trunk.
" E. R. Paine, of Fulham.	" M. E. Budd, of Trunk.
" Ellen E. Jones, of Holborn.	" D. V. Day, of Victoria.
Mrs. E. S. E. Melay, of Flaxman.	

SHEFFIELD DISTRICT NOTES.

We welcome to Sheffield again, after an absence of 17 years, Mr. S. R. Vaughan, our new District Manager, and also Mr. A. W. Beames, who has been promoted to H.C.O. District Manager's Office, from Cardiff.

Mr. S. C. Smith, our late District Manager, retired on reaching the age limit at the end of October, and was the recipient of a portable wireless set from the staff, as a mark of their esteem. It is our sincerest wish that Mr. and Mrs. Smith will enjoy many happy years of retirement.

Mr. J. Wilson, H.C.O., also left Sheffield, on Oct. 18, to take up a similar position in the Manchester District Office, and took with him the best wishes of the staff, together with an electric iron and pedestal lamp as a more tangible expression of their regard.

On Monday evening, Nov. 3, we were honoured with a visit from the Lord Mayor and Aldermen to the Sheffield Manual Exchange.

Miss C. Holmes, Writing Assistant, District Office, and Misses O. Ortori, V. Greenwood, I. Worrall, A. Holding, E. N. Williamson, G. Kinman and N. Elliott, of Sheffield Exchange, have forsaken us to take up the pleasanter (?) duties of matrimony. Our good wishes are extended to them all.

WESTERN DISTRICT NOTES.

THERE seems to be a great deal of interest lately in the famous Uncle Tom Copley, of Widecombe. According to Baring-Gould, the compiler of "Songs of the West," he lived in a house near Yeoford Junction, in the parish of Spreyton. His will was signed on Jan. 20, 1787, and was proved on Mar. 14, 1794. Bill Brewer, Jan. Stewer, Peter Gurney, Peter Davey, Daniel Whidden, and Harry Hawke all lived at Sticklepath, a village near Okehampton.

At the present time the Post Office is busy modernising the little Dartmoor village of Sticklepath, and bringing it into touch with the rest of the world by the installation of a rural automatic exchange. One wonders, had Uncle Tom Copleigh and his friends been living now, if they would have been subscribers. Possibly some of their descendants will be.

Mr. G. E. R. Frost, Contract Officer, outstationed at Newton Abbot, Devon, after spending his official hours in "fishing" for subscribers, seems to be successful in the piscatorial art in other ways, having recently been presented by the Newton Abbot Coarse Fishing Association with a handsome silver cup, suitably inscribed, for having landed the largest roach of the season.

**Impressions of Work in a Labour Exchange.**

LIKE many more Post Office people I have "taken a plunge" and am learning the work of a Labour Exchange Employment Clerk. I cannot say that I liked the change at first—in fact, on my first day in the small Lancashire town to which I was sent I seriously began to wonder why I had allowed myself to be lured from my comfortable berth in the telephone branch. But now I am beginning to enjoy my new work, which is more full of interest and less monotonous than much of the work I have left behind.

As the town in which I work is a cotton and mining town, most of our claimants are mill workers and pit-head hands. There is also a good number of tailoresses on our register, as there are numerous clothing factories in the district. Some of the jobs are strange ones—the mill workers being mainly back tenters, slubbers, putters through, ring spinners and donkey piecers! Weavers and bobbin winders I could understand, but when someone told me she was a donkey piecer and someone else a can-breaker, I was ready to believe anything they told me. The pit-head workers are mostly coal cleaners—work that is anything but clean, judging from appearances. Recently, whilst verifying a woman's occupation (she was a cotton twister), I innocently asked "You are a twister, aren't you?" She confessed to being a twister, and everyone round enjoyed a laugh.

The various branches of tailoring work don't puzzle me—being a woman. Buttonhole hands, baisters and machinists are as plentiful as daisies in summer, but clerks and shorthand typists comparatively rare in this land of mills and factories. Many of the older women have worked in the mill or factory since they were 12 or 13 years old, and if asked whether they can do anything else well, say "No, I've never done any other kind of work. Only been in the mill."

The majority of the mill workers wear clogs and shawls, and "signing on" days are days of great noise and commotion, in spite of the frequent requests for quietness. Try to imagine the tramp, tramp of hundreds of clogs on a wooden floor, the buzz of voices and occasional screech of laughter and you will realise how noisy the place is at times. One thing that is surprising and amusing is the way these people call their overlookers by their full names. For instance, if one asks for the name of the overlooker one will be told "Johnny Bates," or whatever the name may be. No doubt the "Johnny Bates" of the mills are well aware of the familiar way in which their charges speak of them.

During the summer months many of the younger women are offered domestic work in the seaside resorts, and some of them accept these vacancies. One young woman refused to go to Llandudno, saying that she did not wish to go overseas! Another one returned home from her place because she had a suspicion that her girl friend was alienating her young man's affections from her. She did not believe that "distance makes the heart grow fonder" evidently!

Taken as a whole, the people are not difficult to deal with, and if awkward ones do turn up at times one has to make allowances for them. It cannot be easy to be pleasant and good tempered when money is scarce and prospects of work so remote.

E. A.

Sleepers Awake.

Finding myself employed at an Exchange near home, I commenced a course of study in the noble art of English. I recapitulated—as they say in the operating school—that is, I revised my previous knowledge of the subject.

My first homework consisted of an exercise on "Parts of Speech," and I applied myself seriously to this important study. The word "Round,"

it appeared, could be any part of speech according to its position in the sentence.

That night five horses ran a race—I know little about horse-racing and have never “backed a winner” in my life—but how those horses ran! Even the good old English verb was beaten! “Noun” was the winner! He ran the round of the course, past “Adjective,” galloping over the round course; round “Adverb” who was running round and round, and collided with “Preposition” round the course and won by a short head over “Verb,” who should have been the first to round the course. (No, telephonists! this is not a test in correct enunciation.)

By the way, do we ever hear from Croydon telephonists in the “Talk of Many Things” page? You do not know what to write about? Nonsense! Try one of the subjects which were given to me for homework recently.

Write an essay on—

1. The chief features of the newspaper you like best.
2. Write a letter to a friend describing a holiday you have spent.
3. Write a short character sketch of someone whom you know well (using a fictitious name).

G. M. T., Croydon Exchange.

A Telephonist is Made.

My youngest sister decided that she wanted to be a telephonist! Having been a “G.P.” for 2½ years, during which time she steadfastly refused all requests to attempt the “Writers” or “Sorters” exam., she was eventually called up for the London Telephone Service.

She passed through her interview and the various mystic rites connected with medical examinations with flying colours and entered the Telephone School, Clerkenwell.

Eventually she was sent out to one of our large exchanges to finish her training and endure the ordeal of “passing her test.” Thinking to ease her troubled mind, on the evening preceding the “test,” I took her for a long walk, and carefully drew her on to talk of the office, endeavouring to discover any weak points on which I could help her. But no—youthful confidence oozed from every pore: “If I had my test now, at this moment, I should pass,” she said, “I just feel that I’m going to.” Somewhat abashed, I subsided—remembering my own misgivings on the eve of my test, seven years or so ago. If she isn’t nervous she is bound to pass O.K., I thought, so brightly suggested that she should meet me for tea, on the following day, to celebrate the event.

Five-thirty found me at the appointed rendezvous, and after a few minutes up came a somewhat chastened Molly. “They kept me waiting for it till 3.30,” she grumbled, “as if anyone could pass a test at that time of day.” “Never mind,” I consoled, “perhaps next week you’ll have it nice and early, when you are feeling fresh. You will be all the better for an extra week’s training. Come along to tea, it’ll cheer you up.”

The following week’s results were no better, despite the fact that the listening was taken at 10 a.m. “I hadn’t had time to settle down,” she explained—to which I agreed somewhat doubtfully.

The third week was slightly better, though still not good enough to pass. If only a different supervisor could take it,” was the plaint, “this one’s got a horribly sharp manner—she makes me feel all nervous directly she sits down.” Things looked rather black until I suggested that a little debt of a shilling or so could be wiped out—a girl with so many office worries couldn’t be expected to bother over such trifles, she acquiesced.

At the fourth test, even my faith began to waver—Molly arrived home dissolved in tears, quite convinced that the supervisor had a personal grudge against her, causing the entry of many faults against calls which were really quite O.K. “And worst of all,” she sobbed, “she says I’m not trying, and I do try ever so hard.” The only means of consolation which suggested itself to me was a visit to the local pictures—this was accepted gratefully. “Isn’t it funny,” she said brightly, as she donned her coat, “how one minute life doesn’t seem worth living, and the next everything is lovely again?” I agreed, of course, though I began to think that the process of making life lovely again was getting rather expensive. It was time to take other steps!

Later that night I asked if there was any possible reason for people to think she wasn’t trying. “Well,” she said, haltingly, “some time ago they told me to practise reading aloud, and I haven’t been doing so. I thought you’d all laugh at me if I started reading out loud.” I pointed out that this was very foolish, but suggested that the following night we should retire early and she should read to me in the privacy of our bedroom. Consequently the following night, while supper was being prepared, Molly, with a meaning glance in my direction, stated that she didn’t want any supper, as she would like to go to bed early. Thinking regretfully of the warm fire and hot coffee I was renouncing, I also averred that an early night would be pleasant, and made my way upstairs. Having draped ourselves in dressing gowns, to guard against the icy atmosphere, I looked around for the necessary book. “We don’t need one,” said Molly, thrusting a paper covered with minute figures into my hand, “you be a subscriber, say ‘I’m calling,’ then pass the number, and I’ll do the rest.” Somewhat bewildered at first, I soon got the hang of it, and so we went merrily on, I, passing countless numbers, while Molly did the various actions, indicative of throwing keys, capping registers and passing demands over order wires. After about an hour, with teeth chattering and lids nearly closed, I begged for sleep. “Just one more,”

pleaded Molly, who was thoroughly enjoying herself, “be an irate sub.” “Good,” I said, “I just feel like one,” and thereupon let forth a string of abuse, worthy of the worst subscriber on record, being met with the sweet response, “I am sorry; what number are you wanting, please?”

Anyway, the end was worthy of the effort—Molly has passed her test. Doubtless the supervisor is congratulating herself on having trained a somewhat difficult recruit, but I know differently!

B. M. D.

London Telephonists’ Society.

On Friday night we made a journey (Conductor, Dr. T. H. Turney) around the Strowger Works, to wit, and much appreciated it.

Next month, would we no meeting shirk, we’ll hear of “Other People’s Work,” when Mr. Savidge tells to us “The Story of the Omnibus,” and somebody of “Nippy” fame on “Catering” will then declaim—(his name will neither rhyme nor scan, so read your bills to find the man). The date December 5, keep free, and bring a friend or two—or three.

Contributions to this column should be addressed: The Editress, “Talk of Many Things,” *Telegraph and Telephone Journal*, Secretary’s Office, G.P.O. (North), London, E.C.1.

GLASGOW TELEPHONE NOTES.

ON Friday, Nov. 7, the staff of the District Manager’s Office met to present Mr. A. Runciman with a gramophone on the occasion of his retirement from the service. Mr. Runciman was the fifth departure from the Chief Clerk’s Section in a space of ten months, but while with the others the regret of our adieux was tempered by the satisfaction that the officers were leaving on promotion, there could be no such measure of gratification in Mr. Runciman’s case. The meeting, therefore, had a certain melancholy. The speakers were Mr. Coombs, Mr. Law, Mr. Morton, and Mr. Wright. The presentation was made in characteristic style by Mr. Coombs, who appeared to derive a certain vicarious enjoyment from the fact that Mr. Runciman was a bachelor. Mr. Morton was able to recall associations which dated from 1900, in which year Mr. Runciman had joined the clerical staff of the Glasgow Corporation, to be transferred subsequently to the Corporation Telephone Dept., and then to the Post Office on the expiry of the Corporation’s licence. Reference was also made to Mr. Runciman’s many likeable qualities.

On Nov. 13 the staff met again at a social in the Grand Hotel to do further honour to Mr. Runciman. The entertainment consisted of whist and music, and a most enjoyable evening was spent. Mrs. Law presented the prizes. It caused some merriment that she had to hand the “booby” prize to her own husband who had been a worthy winner.

Under the auspices of the Glasgow Post Office War Hospital Committee another entertainment was provided for the ex-soldiers in Erskine Limbless Hospital on Nov. 3. This took the form of a tea-concert, both sections of which were apparently very much enjoyed by the patients, staff, and visitors. The programme was in the hands of Misses “Ino” Brims and “Paddy” McGill, and, as on former occasions, they commanded the services of our friend of the Contract Department, Dave Reid, for his usual comedy contributions. The chair was taken by Mr. F. Lucas (Contract Manager), who punctuated his announcements with a joke or two in his usual happy manner. The remainder of the programme, consisting of solos, duets, and conjuring items, was sustained by friends outside the service, and our thanks are due to The Three Andersons (Flo, Chick, and Bob), Jack Dunsmuir, and (at the piano) W. J. Simmons, for their assistance in this connexion. The Committee’s Secretary, Mr. T. S. Ward, ably organised the tea arrangements, and altogether a very pleasant evening was spent in helping to cheer our less fortunate comrades of the war.

Party Lines.—

A woman is a person who thinks whatever she is doing is less important than answering the phone.—Regina Leader.

TEACHER: “How many rings has Saturn got?”

PUPIL: “I dunno, teacher; we was never on a party line with them!”—*New Westminster British Columbian*.

Promotion.—Miss J. M. MUIR from Writing Assistant to Clerical Officer, to whom we extend our hearty congratulations.

A Day with Pepsys.—Friday: Whatever my business is, I cannot but give way to music on Friday. Up between four and five, and did read in Francis Osborne’s “Advice to his Son”: “Wear your clothes neat, exceeding rather than coming short of others of like fortune,” which I shall try to follow. After dressing to my satisfaction in my new summer black bombazin suit to my office to prepare business against the rest of the day. I bless God I never have been in so good plight as to my health these ten years as I am at this day. But I am at a great losse to know whether it be my hare’s foote (a charm against collique) or my nutmeg (a Kentish charm

against lumbago); but this I do know, and it is a strange thing how fancy works, for ten years ago I no sooner almost handled my fresh hare's foot but I became very well of the pain I had had and so continue. After breakfast back to my office where I fell to writing to two reports for Mr. Downing, and he did not like them but corrected them, so that tomorrow I am to do them anew. On the matter of reports, I do see that, speaking in matters distasteful to him that we write to, it is best to do it in the plainest way, and without ambages or reasoning, but only say matters of fact, and leave the party to collect your meaning. Then spent some time in reading and ordering with a great deal of alteration, and yet methinks never a whit the better, of a report drawn by Creed. Thence to the Court where I heard two or three ordinary tryalls, among others one (which they say is very common now-a-days) a cooke-mayde that run away with a silver tankard, and a porringer of silver, and being found guilty and is likely to be hanged. From thence to a Committee, where much discourse upon the getting of monies in these difficult times. What a most troublesome fellow that Strutt is. His talking and ours to make him hold his peace set my head off akeing all the time with great pain. And yet, for all his follies, he hath the good lucke, now and then, to speak his follies in as good words, and with as good a show, as if it were reason, and to the purpose, which is really one of the wonders of my life. After dinner W. Hewer and I a great deal of good talk touching this office, how it is spoiled by having so many persons in it, and so much work that it is not made the work of any one man, but of all, and so is never done; and that the best way to have it done, were to have the whole trust in one, as myself, to set whom I pleased to work in the several businesses of the office, and me to be accountable for the whole. Then something put my last night's dream into my head, which I think was the best that ever was dreamt. But it was only a dream,—“an empty vision of a night,” but that since it was a dream, and that I took so much real pleasure in it, what a happy thing it would be if when we are in our graves (as Shakespeare resembles it) we could dream but such dreams as this, that then we should not need to be so fearful of death, as we are this plague time. Took up my wife and Deb. at home and thence with them to the King's House to see “The Virgin Martyr”; and it is mighty pleasant; not that the play is worth much, but it is finely acted by Becke Marshall. But that which did please me beyond anything in the whole world was the wind-musique when the angel comes down, which is so sweet that it ravished me, and indeed, in a word did wrap up my soul just as I have formerly been when in love, that neither then, nor all the evening going home, and at home, I was able to think of anything, but remained all night transported, so as I could not believe that ever any musick hath that real command over the soul of a man as this did upon me; and makes me resolve to practice wind-musique, and to make my wife do the like.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(Continued from Vol. XVI, page 254.)

- 1906, Jan. ... Klemmer, of Russia, experimented in double duplex telegraph working.
Single needle and double plate sounders dropped out of use in Post Office service.
- 1906, April ... Decided that a delivery at least three times a week should be given at every place in the United Kingdom—with certain exceptions.
- 1906, May 15 ... Earl of Granard appointed by Sir Henry Campbell-Bannerman (Prime Minister) to assist the Postmaster-General.
Gen. H. H. C. Dunwoody discovered that carborundum could be used as a detector in wireless telegraphy.
G. W. Pickard found that silicon, zincite and chalcopyrite made good detectors.
Prof. G. W. Pierce ascertained that molybdenite had properties similar to carborundum.
- 1906, July 2 ... Postage rates on parcels reduced. Tariff ranging from 3d. for 1 lb. to 11d. for 11 lb.
Poundage on Postal Orders up to 15s. reduced.
“Advice of payment” system introduced in connexion with Money Orders. Remitter paid a fee of 2d.
Poulsen established wireless telephony over a distance of 600 ft.
Telegraph Money Order service started with the Faroe Islands.
- 1906, Sept. 1 ... Documents impressed for the use of the blind accepted at reduced rates.
- 1906, Oct. ... International Conference on Wireless Telegraphy held in Berlin drew up International Radiotelegraphic convention.
- Trunk telephone charges reduced to half price for conversations between 7 p.m. and 7 a.m.
- Maximilian Kotyra, of Paris, invented a keyboard tape perforator in which three solenoids, energised by the letter keys, controlled three tapper punches similar to Wheatstone's.
- (Soldatencow modified the perforator of Kotyra by introducing a distributor and using magnets to operate the punches.)
- 1906, Nov. 20 ... A. E. Keith patented a “line switch” to reduce the number of first selectors in automatic telephone working.
- 1906, Nov. 24 ... Lord Kelvin unveiled a bronze tablet in the “North” Telephone Exchange, London, to commemorate the fact that from 1862 until 1867 Faraday worshipped in the building when it was the meeting house of the Sandemanians.
- Post Office opened radiotelegraphic stations at Tobermory and Lochboisdale, using the Marconi system, and at Hunstanton and Skegness with the de Forest system.
- International Postal Union met in Rome. The Union adopted Reply Coupon system and again dealt with transit rates and reduced postage.
- Average annual number of letters passing through the Post Office, 2,662,600,000.
- 1907, Jan. ... A. C. Booth published his method of duplex Baudot telegraph working.
- 1907, Feb. ... Route via Siberia to Vladivostock re-opened.
- 1907, May 1 ... Minimum annual subscription for telephone subscribers outside the London area, covering 500 calls, fixed at £5.
Poulsen transmitted speech and music without wires for a distance of 170 miles.
Fessenden, of U.S.A., transmitted speech without wires for a distance of 200 miles.
Langmuir devised a “hard” thermionic valve known as the “Pliotron.”
R. von Lieben devised a transmitting valve.
- 1907, July 1 ... Limit of insurance for foreign and colonial parcels raised to £400 and rates reduced to that for letters.
Maximum sum insurable for letters raised to £400. Rate reduced to 4d. for the first £12 and 2d. for each additional £12.
Charge made for the return of undelivered correspondence abolished.
Lee de Forest patented his three-electrode “thermionic” valve for wireless working.
E. Bellini and A. Tosi devised the “Radiogoniometer,” or Wireless Direction Finder.
Select Committee of the House of Commons considered wireless telegraphy and the International Radiotelegraphic Convention. British Government ratified the convention.
Act passed authorising the raising of additional sum of £6,000,000 for telephone extensions.
“Measured rate” adopted in the telephone service. The annual rental included a certain number of calls and additional blocks of calls could be paid for on a graduated scale.
Telegraph Money Order service started with Bulgaria and Iceland.
Magazine Post between United Kingdom and Canada introduced.
- 1907, Oct. 1 ... American Express Company reduced charges on parcels to United States by one shilling.
Route to China via Siberia opened for mails.
Dr. J. A. Fleming predicted that speech would be possible across the Atlantic.
“Touch-typing” introduced in Central Telegraph Office, London.
- 1907, Nov. ... Photograph transmitted over the London—Paris telephone circuits by means of Professor Korn's system.
Courts decided that Post Office could claim royalties on certain private telephone lines, a right questioned by the National Telephone Company.
- 1907, Dec. 17 ... Lord Kelvin, of Largs, died.
4,000,000 telegrams accepted by telephone and 2,000,000 delivered by telephone during the year in Great Britain.
(To be continued.)

THE Telegraph and Telephone Journal.

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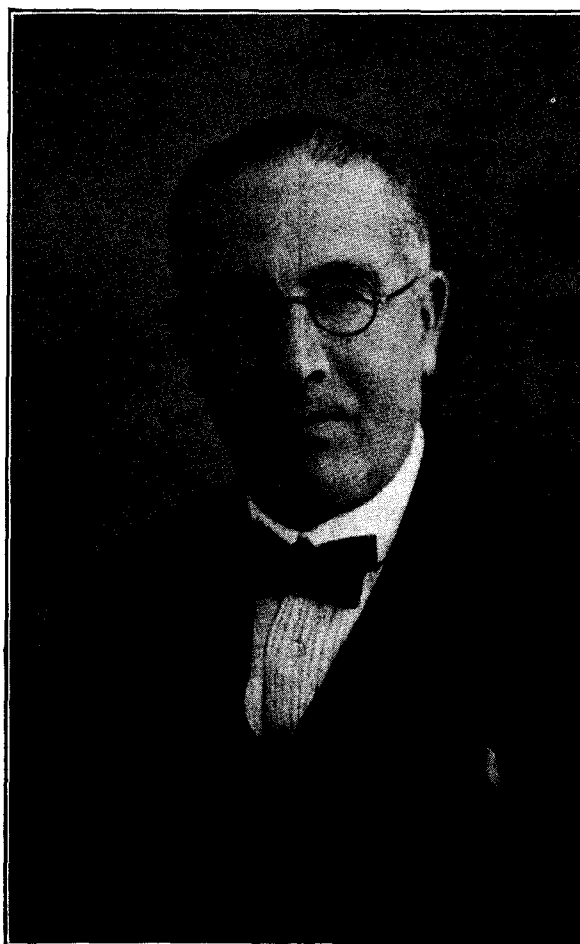
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXXII.

MR. HERBERT GEORGE CORNER.

HERBERT GEORGE CORNER came to the Telephone Service in 1899 at the age of 30, and was placed in charge of the Holborn Exchange in the following year. He had a unique experience in 1904 when the operating staff of the Exchange went on strike—a strike promptly and happily settled with honour to all parties. Joining the National Telephone Company's Traffic Office for the Metropolitan District in 1906, he was translated to corresponding responsibilities in the combined London Telephone Service when the Company's business was absorbed by the Post Office in 1912. He was promoted Superintendent in 1923 and has had oversight of the Staff, Establishment, Statistical and Training Sections.

Probably no transferee from the Company so quickly assimilated the spirit and outlook of the Civil Service as Corner, who has associated himself with almost every aspect of



general interest to the Service. He was one of the founders of the Society of Civil Servants and also of the Institute of Public Administration. Of this latter organisation he has been the Honorary Secretary since its inception, and it is pleasant to think that on his retirement he will have the time to carry on and extend the work of the Institute. He has also served on the Committee of the Civil Service Annual Dinner, since its revival a few years ago, and, indeed, aided and abetted by a brilliant partner, his wife, found interest in everything that touched the life of the Civil Servant.

Corner will be missed in the London Telephone Service, for he is a "character" with a charming and distinctive personality, including an intriguing pose of forgetfulness. With a passion for walking in the highways and byways of the country, he is a very encyclopedia of knowledge in the history and topography of London Town and City. Corner leaves us, but he will retain, and we shall retain, a "corner" in our hearts.

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

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No. 190.

RETIREMENT OF MR. W. T. LEECH, C.B.

MR. LEECH'S retirement at the end of last month has ended a remarkable Post Office career, and one which was unusually rich in personal contacts. His work in the Establishments and Staff Branches of the Secretary's Office, which between them claimed almost threequarters of his 45 years of service, brought not only his name but his personality within the ken of large numbers of his colleagues of all ranks; and no member of the hierarchy which sits in the comparative seclusion of St. Martin's-le-Grand is more widely known, and more widely liked, throughout the length and breadth of the Post Office.

Mr. Leech entered the telegraph service at Leeds in 1885—the year of the sixpenny telegram—and seven years later was transferred to Headquarters, at first on loan. He was allotted to the Establishments Branch, and in course of time became the veritable Atlas of that intricate and forbidding world. The climax of his Establishments Branch career came with the Hobhouse Committee of 1906-08; and the latter year brought him his first promotion on the Higher Division (on which he had been placed in 1903). The aftermath of the Hobhouse Committee kept him busy till nearly the end of 1912, when he was transferred to the Staff Branch. There he became Principal Clerk in 1914, and Assistant Secretary in 1920. Less than five years later he was switched over—the metaphor may be considered not inappropriate—to the Telephone Branch, to serve there an apprenticeship of some two and a half years before becoming Director of Telegraphs and Telephones.

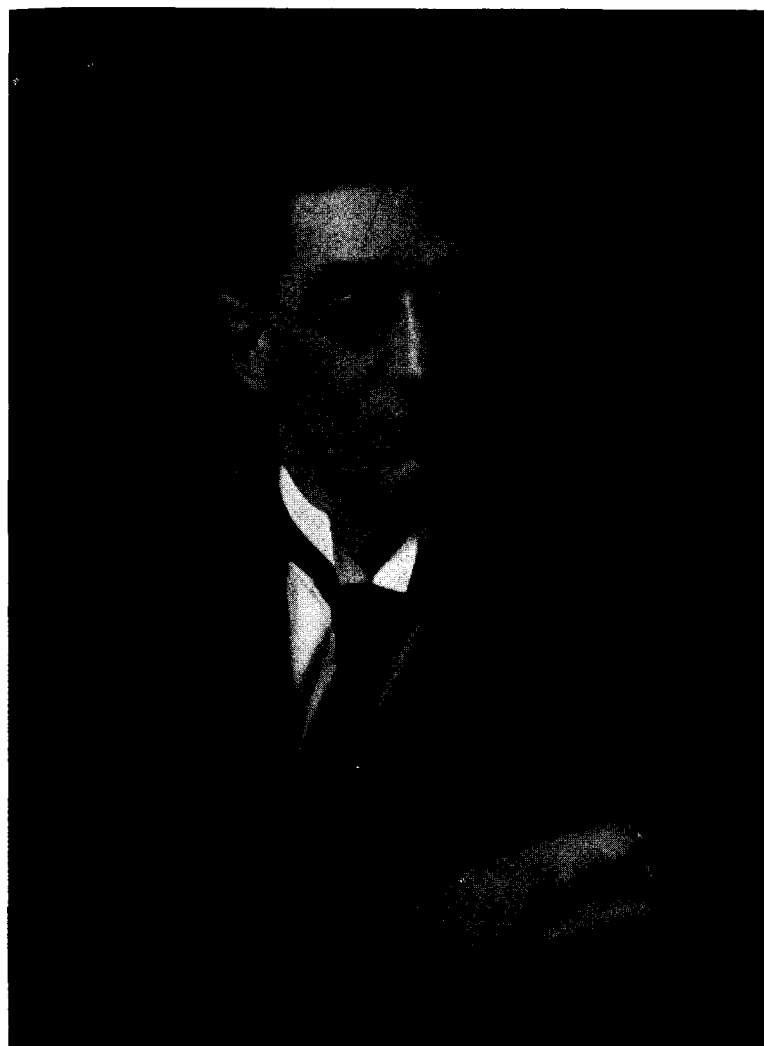
Mr. Leech had not been in the Telephone Branch two months before the *Journal* included him in its serial gallery of "Telegraph

and Telephone Men." This was not nearly so precipitate as it may have appeared. To say nothing of his experience on the telegraph side in his official infancy, Mr. Leech had naturally been largely concerned, in the Establishments Branch, with one not unimportant, if non-technical, aspect of the electrical communication services; he had had much to do with the transfer of the National Telephone Company's staff to the Post Office; and his work in the sphere of recruitment had contributed a good deal to the efficiency of the engineering side. But the *Journal* was amply justified on another ground also. Mr. Leech's ready adaptability enabled him very quickly to become as much "at home" and as firmly rooted in the world of telephones as though he had never belonged to any other. It is a small but significant fact that, after his subsequent elevation to the Directorship, though he had spent only what looked like a brief transitional period in the Telephone Branch, he never quite lost the habit of using "we" in speaking of that branch, as distinct from one of the other branches under his control.

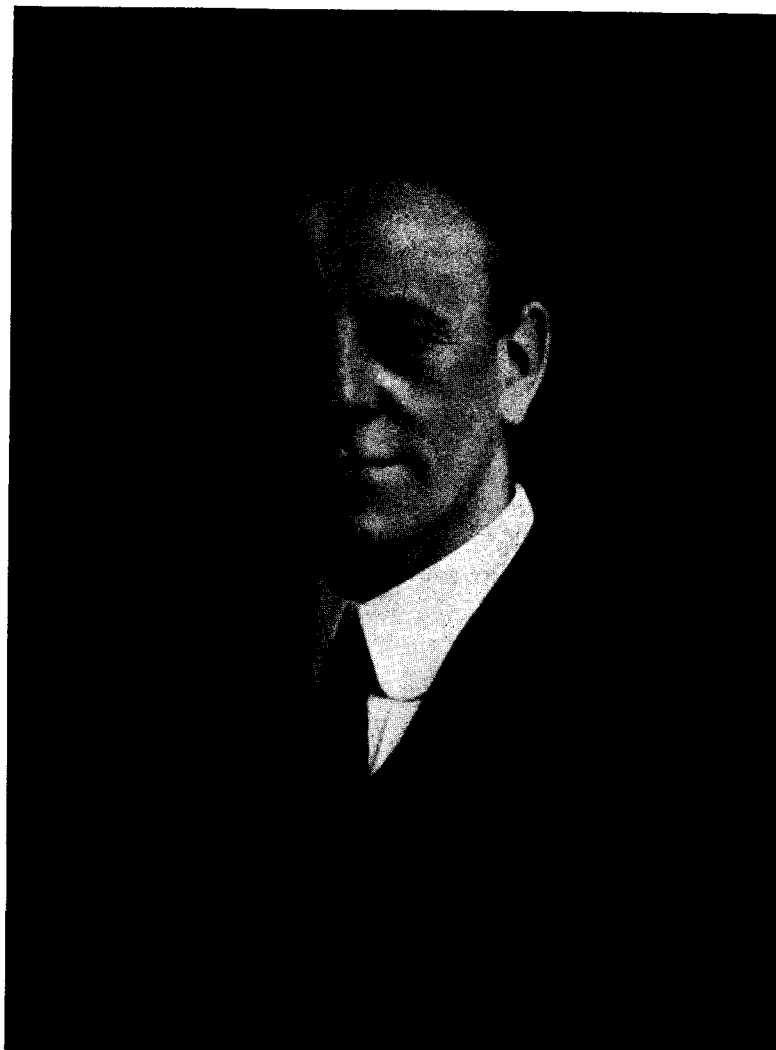
Not that he identified himself with the new sphere at the expense of forgetting the old. On the contrary: whatever he had learnt in the course of an already long career was always there to help him in dealing with a new set of problems. This means much more than that he has a retentive memory. It means that the contents of an unusually well-stocked mind are always readily at call, and the appropriate bit of experience, be it official or extra-official, leaps up, as it were, spontaneously to contribute something to the effective handling of the question immediately at issue. To one who worked in close contact with him there was nothing more fascinating than the way in which he would bring to bear on the matter in hand something observed or heard or read, possibly years earlier, in a quite different connexion. Yet he was always the master of his experience, never its slave. His wealth of accumulated knowledge did not prevent him from retaining the freshness of outlook which is more commonly associated with the "new mind."

Among his other distinguishing characteristics one might single out a rich fund of practical shrewdness and *savoir faire*, a never-failing resourcefulness, an openness to new ideas, an essentially experimental habit of mind, a quick discrimination between the things that are worth personal trouble and those that are not—qualities which in their totality provide a good equipment for the successful administrator, more particularly when united, as they so conspicuously are in Mr. Leech's case, with an equable temper and a complete freedom from all that is angular and crotchety.

Of Mr. Leech's purely personal qualities one is tempted to say much; but there is an imperious, if unwritten, law of reticence, to transgress which would be in any case reprehensible, and in this case unpardonable: for Mr. Leech abhors the limelight, and one scarcely dares hint at his modesty for fear of wounding it. Let it suffice to say that no chief could excel him in the kindness, the helpfulness, the generosity which win a man the affection of those who work for him. Nor, of course, has his native capacity for inspiring friendliness been without importance from the purely official



MR. L. SIMON, the new Director of Telegraphs and Telephones.



[By courtesy of "St. Martin's le Grand."]
MR. W. T. LEECH, C.B., the retiring Director.

point of view. In any matter in which he has had to represent the Department—and his dealings with the Treasury and the Staff Associations, to say nothing of other bodies, have been unusually extensive—one cannot imagine him as failing to be that most valuable of assets, the *persona grata*.

All readers of the *Journal* will wish him long life and happiness in his retirement.

L. S.

A RETROSPECT OF 1930.

A REVIEW of the progress of the telephone service during 1930 shows that, despite a year of unusual trade depression, there was an increase of about 110,000 stations. As far as can be ascertained at the time of writing, before complete returns are to hand, there were 1,958,000 Post Office telephone stations in existence at the end of the year. This total, with the addition of an estimate of 39,000 for the Hull, Guernsey, and Jersey systems, and for the railway and other private telephones admitted to exchange facilities, brings the total number of telephones in Great Britain to a figure just short of two million, viz., 1,997,000. The

detailed figures, when available, may or may not reveal that the two-million stage has actually been reached. At any rate it will be reached during the present month. During 1930 the number of exchanges reached 4,836 (an increase of 230) and the number of call office stations 33,800, an increase of 3,900.

The following progress was made in the conversion of the system to automatic working.

31 automatic exchanges were opened, serving 22,270 subscribers. Included in these figures are 7 London exchanges, serving approximately 10,300 subscribers, there being now 30 automatic exchanges working in London, serving approximately 96,000 subscribers. During the year a commencement was made with the installation of the director system in Manchester. Three such exchanges (Ardwick, Collyhurst, and Moss Side) were brought into service. Other additions to the automatic system in the Provinces include Maidstone (with 7 subsidiary exchanges) and the opening of subsidiary exchanges in the Edinburgh, Nottingham, and Blackpool areas. Dudley, which has had the Rotary system for some years, has been converted to the standard step-by-step system, concurrently with the provision of apparatus of similar type at the neighbouring exchanges of Brierley Hill, Stourbridge,

and Cradley Heath. Upwards of 200 rural automatic exchanges were brought into use during the same period.

In the trunk service, the process of transferring calls from a "delay" to a "no delay" basis has been continued, and the policy under which trunk calls dealt with during the busy hours on a "delay" basis are passed forward outside the busy hours on a "no delay" basis has been extended. In this connexion new methods of special control have been authorised, the initial positions have been designed and manufactured and are about to be installed. The policy of placing main trunk routes underground has made further progress, the trunk cable between London and Aberdeen being brought into use during the latter part of the year.

In January the Post Office embarked on a new enterprise when a public picture telegraphy service was opened between London and Berlin. This service has been followed by other public services with Frankfort, Munich, Copenhagen, Vienna, and Stockholm. In addition, the Post Office installation exchanges pictures with private stations in Paris and other continental cities. The traffic has so far consisted chiefly of press photographs, but plans, fashion designs, ordinary writing and even finger prints have been transmitted. The quality of the work done is very good.

Further important extensions of the overseas telephone services took place last year, chief of which was the subscriber-to-subscriber radiotelephone service opened between Great Britain and Australia. Commencing with a service to Melbourne and Sydney in April, communication was gradually extended to other places in Australia at one end and to the principal countries in Europe at the other during the course of the year, a switched service between America and Australia being also established via London. In May the basic charge for calls on the transatlantic service was reduced from £3 to £2 a minute. Other trans-oceanic services opened were those to the Argentine, Chile, and Uruguay, which are now provided by direct radio service from London, although inaugurated in May via Madrid. In June a service was opened via Amsterdam to the principal towns in Java, whilst a service between London and Rio de Janeiro via Paris was inaugurated in May. These two services are opened for a limited number of hours daily only, and calls can be connected only to specified call offices. The other services referred to, however, are full services between subscriber and subscriber. During the past year additional cables were laid between this country and France and Belgium, while amongst the additional Anglo-European services opened were those to the Vatican State in February, Lithuania in March, and Estonia and Latvia in June, leaving at the present time only Russia and the Balkan States without direct telephone communication with England. Existing facilities to the Continent were improved by the provision of additional through wires to Düsseldorf, Milan, Berlin (2), Hamburg, Cologne, Paris (5), Stockholm, Barcelona, and Basle, whilst through circuits to Marseilles, Prague, Budapest, and Oslo, and additional circuits to Paris, the Hague, and Rotterdam are expected to be completed shortly. A new development of the wireless service, that enabling a telephone subscriber to call up from his office or home to liners at sea, was inaugurated during the past year, the *Majestic*, *Olympic*, *Leviathan*,

and *Homeric* being the first vessels to be equipped with the necessary apparatus. This service was also extended during the year to the continental principal countries. As we go to press we learn that the transatlantic service has been extended to *all* parts of North America including Cuba.

The past year has not been a very satisfactory one for the Post Office telegraph service. Twelve months ago the rate of traffic decline showed some signs of slowing up, but these signs proved to be fallacious, and the decrease this year has been greater than for several years past. All other telegraph undertakings here and abroad have suffered in greater or less degree from the universal depression of trade and a business revival is necessary before a more satisfactory state of affairs can come about. The past year, however, has seen marked progress in the improvement of the machinery of the service. Labour-saving machines of a uniform type are being installed rapidly and will enable the service more effectively to meet any demand that the public may put upon it.

HIC ET UBIQUE.

WE offer our heartiest congratulations to Mr. L. Simon on his appointment to the position of Director of Telegraphs and Telephones in succession to Mr. W. T. Leech.

In order to meet the continued growth of telephone traffic between this country and Germany, additional telephone circuits have been brought into service to Berlin and Cologne, making a total of 23 circuits connecting this country with Germany. Of these 23 circuits, which at this end are all operated from the London Trunk Exchange, nine terminate in Berlin, seven in Hamburg, two each in Cologne, Düsseldorf and Frankfort (Main), and one in Bremen.

A new telephone circuit connecting London direct with Barcelona has been brought into use, supplementing the two circuits already in operation between London and Madrid.

On Dec. 12 last direct radiotelephone communication was established between this country and Argentina, with extension by land line in South America to Uruguay and Chile.

The hours of service will for the present be 1.30 p.m. to 10 p.m. (British time). The service will be available on this side to all parts of Great Britain and Northern Ireland and in South America to subscribers (at their ordinary telephones) in the following areas:—Argentina—principal towns in the provinces of Buenos Aires, Cordoba and Santa Fé; Uruguay—Monte Video; Chile—Santiago, Valparaiso, and Vinadelmar. The charge for a 3-minutes' call to the City and Province of Buenos Aires will be £6; to the remainder of Argentina and Uruguay, £6 6s.; and to Chile, £6 12s. From Northern Ireland and the Isle of Man the charges are 6s. more in each case.

"As a rule, there is nothing more irritating than standing with a telephone glued to one ear for what seems to be an eternity," says a Yorkshire paper, "but I was not the least bit annoyed last night. Indeed, I should like to thank whoever was responsible for the wait, and I should not have minded had it been longer. For as soon as the operator had been told the number I wanted, there came over the wire the voice of a woman singing.

It was a charming voice. The song was unfamiliar to me, but every note could be clearly heard; and I had three or four very

enjoyable minutes before the operator ended the concert for me by putting me through to my number.

And now I am puzzled. Whence came that song? Surely no subscriber would ring anyone up to sing to him or her over the telephone? Did my line get "crossed" with a B.B.C. land line?"

We do not like these matter of fact explanations. Fancy trying to explain away a charming and mysterious occurrence such as this by a "crossed line!"

"We often read in the London papers" (says the *Yorkshire Telegraph*) "severe strictures on the telephone system, and to many professional humorists the idea that you always get a wrong number when you ring up has become a stock joke. Either these people are wrong, or the telephone service is one of the things that they order better in the Provinces."

Either explanation should suffice; but our contemporary should not lose sight of the fact that "stock jokes" take no heed of right or wrong.

"Wrong numbers" do not cause much concern to some of our contemporaries so long as they apply to telephone statistics. Whilst the *Daily Express* has been broadcasting in large type as current statistics some figures which, as far as we can trace, apply to 1925 (although the U.S.A. is exalted from 15.6 to 16.0 telephones per 100 of population and Canada from 12.7 to 13, whilst Germany is reduced from 4.3 to 4 and Great Britain from 3.4 to 3!), some figures from a speech by Sir Alexander Roger are widely broadcast in other papers. Sir Alexander indeed employs the latest available figures (those for 1929) but whilst that for Great Britain is correctly given as 42 per 1,000, the figure for Germany appears (perhaps by a printer's error) as 60 instead of 50!

A party of boys from Eton College visited Holborn and the G.P.O. (South) building recently, with the President of the Eton Scientific Society.

The following letter shows that they appreciated their visit—which ended with tea in the G.P.O. (S.) refreshment room.

Sir,—On behalf of the Eton College Scientific Society, I wish to thank you for the excellent arrangements you made for our excursion to see the Holborn and London Trunk Exchanges on Tuesday. Our visit was extremely interesting, and the various pieces of telephone apparatus were fascinating in their complexity. We were very struck by the alive and progressive spirit which we found at both exchanges, and we came away with far better views of the organisation of the Post Office as a whole.

Will you please convey to all the different officials who made our visit so instructive and enjoyable, our grateful thanks?—
Yours faithfully,

R. WEATHERALL.

Eton College, Dec. 11.

The Electrical Review, in its issue of Dec. 19, refers to the question of "Engineering Definitions" raised by our correspondent "X" in the June issue. After saying that engineers of all men should be most accurate in their device and use of technical definitions, they conclude:

"In the *Telegraph and Telephone Journal* a correspondent deprecated the use of "phantom" and "ghost" circuits as totally meaningless and therefore unsuitable: he rightly pointed out that "super-posed" is understandable and also correct. The same journal stated that proposals have actually been set forth for styling a circuit superposed on two "phantoms" as a ghost, and on two "ghosts" as a "spook."

We may conclude by stating our agreement with the view there expressed that the English language is fully able to provide correct and understandable words and expressions without the need for adopting fantastic importations."

POST OFFICE ENGINEERING CONTRACTS.*

By G. W. BELL (*Engineer-in-Chief's Office G.P.O.*)

I.—Introductory.

The object of this paper is to give a comprehensive sketch to enable you as State servants, having diverse interests in the telephone enterprise, to appreciate a little of the working, more particularly from the Headquarter's aspect, of the contracting as distinct from the normal engineering function of the Engineering Department.

The principles which underlie these activities will be exemplified by references to actual practice. The legal aspect of contracting can be studied from works by recognised authorities, and it may be stated that Dr. D. A. Stroud, of the Solicitor's Department of the Post Office, read a useful paper entitled "The Law of Contract," to the I.P.O.E.E. in 1910.

It will suffice at this stage to state that a contract may be defined as an agreement enforceable at law expressing the intention of two or more minds to do or to refrain from doing certain acts. There are, however, a few exceptional kinds of agreement which are not so enforceable.

By way of contrast, reference might be made, entirely without malice, to a form of contract perhaps more familiar to many than an engineering contract. I refer to the Telephone Subscribers' Agreement, and as telephone officials we may even have set the good example to others of entering into such a contract with the Postmaster-General. This is rather a one-sided "Agreement" (probably few subscribers here would *agree* with all its terms) which scarcely seems to be phrased in harmony with an avowed wish to boom and popularise the telephone. Coming at the end and crown of all our efforts to provide an excellent service, and constituting the link between the supplier and the client whom we all wish to secure, the terms of the Agreement might perhaps be toned down a little. It is, however, a very human failing to lay down the law, and even if the would-be subscriber reads the conditions in the small print used, he doubtless sighs and as many another has done, with a plunge he takes the telephone "for better or for worse."

Fairness, however, demands it should be stated that, when the Postmaster-General is in the market for plant and equipment essential to the telephone service, which are ordered in his name by the Engineer-in-Chief, he can no longer be described as an "austere" man. The conditions of contract used are generally such as permit the parties to contract freely on a fair basis of equality. Some years ago, Contracting Departments acting together, decided that as a measure of economy, "onerous" clauses which contained requirements of a speculative character tending to a general inflation of prices, should be eliminated from the forms of tender in use, and action was taken accordingly in the Engineering Department.

II.—General.

The Engineer-in-Chief acts for, and under the direction of, the Postmaster-General as represented by the Secretary to the Post Office. All major negotiations with contracting interests, questions of contract policy and financial expenditure are subject to the authority and control of the Secretary.

The Comptroller and Accountant-General has wide powers in matters of Post Office Departmental finance and expenditure. He is the ultimate adviser to the Postmaster-General on contract questions, particularly those affecting financial considerations. He is answerable to the Public Accounts Committee of the House of Commons as to the conduct of all Post Office contracting.

A very wise man said, long ago, that "a threefold cord is not quickly broken." The Engineer-in-Chief, with his administrative and executive staffs, who are in touch with overseas Administrations, the Contractors with their world-wide technical and other resources and associations, conjoined with the excellent and helpful co-operation of the Controller of the Post Office Stores Department, who arranges supplies of stores for erection and installation by our engineering staffs, form such a cord.

Close touch is maintained with the Controller, Stores Department in regulating prices, and in important negotiations in which both Departments are concerned in relation to the trading interests.

Our objects, simply stated, are to study and decide what is wanted, taking the long view to facilitate future development, to allow individual firms in certain trades to supply their own special products so far as standardisation permits, and to secure high class goods at the lowest prices obtainable on a commercial basis.

Headquarters' engineering officers are in constant touch with Telephone Exchange Contractors with the object of improving the service in matters of design, construction and maintenance, and this object is achieved by the co-ordination with them of the Department's proposals. Special attention is now, of course, being focussed upon automatic equipment, in which important developments are impending. Notable progress is also being made by the Department's Engineers in repeaters, main cables, and in radio equipment, much of the last being designed, constructed and installed by

*Paper read before the Post Office Telephone and Telegraph Society.

the Department's own staff, whose work is of a very high order in comparison with outside products.

Post Office Engineers prepare specifications of works, frame estimates of expenditure, and seek the necessary authorities. The Contracts Section makes contracts and acts in close collaboration with the engineers, relieving them of a good measure of direct negotiation in matters of contract involving financial and commercial considerations as distinct from purely technical matters. Superintending Engineers and their staffs undertake the supervision of the works. The country is divided into fifteen Superintending Engineers' districts.

III.—Historical Review.

The earliest records of the employment of Post Office Works Contractors show, that from about 1898 onwards, many miles of backbone underground pipes were laid to the North and West of England. In London the extensive underground development of local exchange areas was then initiated, networks of aerial wires and roof poles being removed, and earthenware octagonal ducts surrounded by concrete were used for the larger formations where cast iron pipes were not suitable.

As work of this type increased, the Stores Department handed it over to the Engineer-in-Chief in 1902. The former Department, however, still supplies under its own separate contracts, the various conduits and stores which are laid under the Engineer-in-Chief's works contracts, and by direct labour. This arrangement is businesslike, as it permits the many small contractors available to tender without the financial and other difficulties associated with the supply of costly stores.

In 1907 the first telephone exchange equipment contract was placed by the Engineer-in-Chief. Previously such contracts were made by the Stores Department on the Engineer-in-Chief's specifications.

The increase of contracting work necessitated simplification of Departmental procedure. The precedent approval of the Secretary, which had to be obtained in every case before any contract could be made, was devolved to the Engineer-in-Chief in 1911.

The large development of local exchange areas which followed the absorption of the National Telephone Company in 1911, necessitated the calling in of the telephone cable manufacturers. Several series of area contracts were arranged for trenching, conduit laying, cable manufacture drawing-in and jointing to completion. The last of these was arranged in 1920-21. Overhead charges were high, competition was more nominal than real, small conduit-laying firms were necessarily excluded, and this method of contracting was discontinued as unduly costly.

Contractors were first employed on trunk telephone cabling works about 1912, and they still do the bulk of this type of work.

Attempts were made about 1913 to provide for the increasing development in trunk line conduit works by arranging lump sum competitive contracts. The works were mainly along country roads. The work was so speculative owing to risks of extra depths, due to obstructions and to other difficulties, and consequently costly, that lump sum tendering was abandoned.

In 1914 a measure of devolution of contract work to Superintending Engineers was authorised, subject to certain conditions designed to secure uniformity of treatment of contract matters.

The economical evolution of the conduit and cable under scientific progress is interesting. The supersession of cast-iron pipes by earthenware ducts represented a great saving in expenditure. The original conduits could only accommodate a few gutta-percha covered wires which often became fearfully tangled, but when these were drawn out to give place to lead-covered paper-core cables, the gutta-percha material had a large recovery value. The weight of copper per mile of circuit pair necessary for efficient transmission has been reduced in course of time, and the number of circuits which can be accommodated in cables increased to such an extent, that it is now possible to provide a cable containing 1,800 pairs to be drawn into a conduit. What these improvements mean will be appreciated when it is remembered that conduit lines are expensive to construct because of the high cost of breaking up and restoring streets.

The loading and balancing of trunk cables combined with the use of repeaters depending upon the thermionic valve, and the superposing of circuits upon physical pairs have also enabled large economies in copper, increased numbers of circuits in a cable, and improvements in transmission efficiencies to be effected.

As to exchange equipment, various measures have been taken from time to time in the interests of the telephone service to keep contractors regularly employed, to advance production and to facilitate the availability of the equipment. In 1910, prior to the acquisition of the National Telephone Company's system, much of the plant being obsolescent, in poor condition or inadequate to meet the rapidly increasing demands for the telephone large contracts, called "Hospital" orders, for supplies of apparatus were made. These stocks were "nursed" by the Stores Department until definite exchange schemes could be formulated, and they were then drawn upon to be included with other equipment provided by the contractors who installed the specific exchanges.

The mass of unnameable screws and gadgets had to be kept distinct from the material supplied under the contract for the particular exchange, so as to avoid duplicate payments being made, and the necessary accounting procedure proved costly both to the Post Office and to the contractors concerned.

In 1922, in order to keep certain telephone exchange contractors employed, "Stock" orders were placed by the Engineer-in-Chief for 20,000 lines of automatic equipment.

IV.—Policy and Scope of Contracting.

The policy followed in the Engineering Department is to place out to contract the manufacture, and installation on site of plant and equipment but to reserve certain classes of construction work to be done by the Department's own directly employed labour.

The system of contracting is that of limited (i.e., not open or advertised) competitive tendering amongst approved and selected firms.

Contracts made by the Engineer-in-Chief are for *works* (including stores and equipment). Those made by the Controller, Post Office Stores Department, are for *supplies* of stores to be stocked against requisition by the Engineering Department for erection by its personnel, or in some cases by its contractors.

Under Engineering Contracts the following main classes of works are provided:—Telephone exchanges and extensions, private branch exchanges, repeater stations, power plant, batteries, lighting, heating, and lifts, main and submarine cables, underground conduit laying, pneumatic tubes, radio equipment and masts, fire alarms, postal conveyors and bag cleaning plant.

The average annual value of these contracts during the past seven years is about £4½ millions sterling, and since 1902, when contracting was initiated in this Department, the total value of contracts placed is well over £50 millions.

The proposed annual contract programme is framed in the autumn of each year, and after general approval in bulk, specific works are authorised to be executed in the ensuing financial year.

V.—Tendering.

In coming to closer grips with the business of contracting, I would remind you that a tender is an offer to supply goods or undertake a work on specified terms. To obtain a tender is the first step following the formal invitation to tender, in the making of a contract. Until a tender is accepted no contractual obligation rests upon the parties concerned.

In Government contracting, firms admitted to the general lists of approved tenderers are those well recommended by competent persons for work done elsewhere, who are financially sound, have undertaken to pay fair wages, are enrolled on the King's National Roll, and who are not "blacklisted" by other Government Departments in consequence of irregularities which they have committed.

Tenders are only sought from approved firms, and normally, therefore, the question of a firm's competency or otherwise to do a work is not proper to be raised, once a firm has been invited to tender.

Tenders must be signed by persons authorised to do so. Initials are not accepted.

No more time is allowed, for obvious reasons than is barely necessary for an inspection of the site and the preparation and submission of tenders.

All tenders received for each work are opened together at an appointed date and hour by two senior officers who initial the tenders and record the prices.

Late tenders are generally rejected, but when doubtful cases occur the question of their admission is given special consideration.

Requests for extensions of time in which to prepare a tender, require very careful handling, especially if the basis of tendering is competitive. Firm reproof has been administered to responsible members of contracting concerns who betray a tendency to make a telephonic request at the last moment for a few hours' extension of time, stating either that the price is not ready, or that they have found a mistake, and so forth. Such requests are, of course, refused.

Recently, an important firm, on being invited to reduce a price which was considered excessive, stated in replying for the information of the Postmaster-General, that it had a good idea what prices its competitors tendered for the class of work concerned. This incident justifies the care which from the viewpoint of the Department's own interests, has to be taken at all stages of the treatment of tenders and contracts to assure amongst other things real competition.

Tenders received are examined, rates scrutinised, priced out, totalled, checked and compared for excessive variations above or below a normal level. "Impossibly low" tenders, or rates which are incongruous are specially considered, and confirmation or rectification sought from the tenderers concerned.

Objectionable stipulations by the lowest tenderer are taken up. Extras and deviations, anticipated or possible, are closely considered as to their financial effect on the tenders as a whole. Tenders for plant lowest in capital cost are not always the best received, as running cost, efficiency, or life of the plant have also to be considered.

The Post Office does not bind itself to accept the lowest or any tender, but the lowest is usually accepted. Higher authority is required for the acceptance of tenders other than the lowest, as also for the making of contracts without resort to competition. In the latter type of case, special accounting

certificates as to price are given prior to authorisation of the making of the contract.

Tenders for conduit laying works are obtained on the basis of prices which include the cost of reinstatement of the pavings disturbed. This ensures careful work when the contract is made and also renders it advisable for contractors to report any excessive demands for reinstatement which may be made by a Highway Authority, before work is put in hand, so that effective action can be taken. Provision is made for deviations from standard depths and conditions to be ordered at scheduled tendered rates. These are closely scrutinised in relation to the anticipated extras and necessary reductions obtained before a tender is accepted.

The Department is able at times to avoid charges for reinstating pavings when conduits are laid in association with road reconstruction. In such cases tenders are obtained on the basis of the contractor's principal liability terminating, after the ground has been restored prior to permanent reinstatement.

Tenders for works to be performed on "Time and Material" conditions are rare, and special safeguards are introduced to ensure that only costs based on economical levels are paid for by the Post Office.

Persons tendering are allowed to suggest modifications, provided they also submit a tender for the scheme as specified, which can be compared with others received. They are also required to inspect the site of the work, to be responsible for the actual conditions to be met with, for example, in road surfaces and foundations, and to make their own enquiries to satisfy themselves in these matters. Tenderers know that their contractual liability does not extend, for example, to the cost of renewing flags or setts already broken before being disturbed by their operations. An important condition included in certain contracts requires the contractor to undertake responsibility for the Department's specified scheme of work, so that its validity cannot be called in question after a contract is made.

Tenderers are required to allow their offers to stand for a month at least before they may give notice of withdrawal, when the notice must be in writing. An opportunity is given to confirm or otherwise a tender held for an unduly long time before acceptance, as objection on such grounds raised subsequently to acceptance has been held to be valid.

It is important that contract clauses be reasonably interpreted, as otherwise the line of action taken would not be likely to stand the test of a Court of law, which is the ultimate authority to be envisaged in the business of contracting, in the event of dispute or disagreement arising which cannot be settled otherwise.

Methods of tendering applied to various types of work contracted for are under constant review, and changes are made according to circumstances.

VI.—*Making a Contract.*

Contracts are made by the Engineer-in-Chief on behalf of the Postmaster-General, and the form of acceptance of the tender is called an Engineer's Order. These contracts are made in writing and are called simple contracts, not being under seal as in the case of those made by a Corporation.

The main essentials in the making of a good contract are, that the parties must have legal capacity to contract, their intentions must be clearly expressed and communicated to one another, the terms of acceptance must accord precisely with those of the offer, and the subject matter, price, time, signature and date of the tender, including all the documents, must be free from ambiguity and in order. The contract must, of course, be possible of performance.

The acceptance of a tender is complete and the contract thus made when the letter of acceptance is posted. If a letter revoking the tender crosses the acceptance in the post the contract is still binding, as a letter of revocation only becomes operative when it reaches its destination.

Contracts are made with principals of firms and not with agents.

Bona fide clerical errors in tendering, brought to light soon after a contract is placed, are allowed by the Treasury to be rectified on certain conditions.

Contracts for telephone exchange equipments are made for a lump sum price, plus a schedule of rates for deviations; and for exchange extensions at scheduled rates. For main cabling works, prices per yard are quoted (a) at factory, with adjusting scales to allow for fluctuations in metal prices, and (b) for freight, drawing-in, jointing, and testing on site. For radio equipments, lifts, conveyors, heating, bag cleaning, ventilating and other types of plant, lump sum price contracts are arranged.

Contracts are only made after authority for the expenditure has been obtained, and when buildings, stores, wayleaves, &c., are expected to be ready for work on the site to proceed on the due date tendered.

VII.—*Additional or Varied Work and Prices.*

The negotiation of extra rates after contracts are made is often necessary, and this is undertaken by experienced officers at Headquarters.

Work may be Added or Omitted up to 10% of the value of the contract, but proposals exceeding that limit require the contractor's agreement.

The addition to existing conduit contracts of separate works of suitable proportions, the need of which has arisen subsequently, is economical, and saves time otherwise spent on separate tendering. Reduced prices are often obtainable in such cases. This procedure, which several Superintending

Engineers follow in preference to seeking tenders under the authority devolved to them, is facilitated by the fact that the Department's contractors are normally engaged on works well distributed throughout the country.

On the other hand, in the case of telephone exchanges, the ordering of additional or varied equipments of an important size or character after contracts have been made and during progress of the work, involves serious objections from both the technical and the contract points of view, to the Post Office and to the Contractor. The equipment is extremely complicated, and alterations made to work already planned in detail lead to unduly increased costs, great waste of effort and time, and to delays in planning and executing orders for straightforward works. Incidentally, also, alterations so ordered enable contractors to press for extensions of time which cancel delays for which in all probability they would otherwise have become liable in liquidated damages. Arguments for and against the ordering of important alterations seriously affecting a contract once made, have been keenly discussed, but such major alterations are usually held to be justified on traffic or engineering grounds.

VIII.—*London Automatic Telephone Agreement.*

Agreements were entered into in 1923 and 1924 with the four exchange equipment manufacturers for the provision of "Director" equipment in the London Telephone Area. Orders were distributed in agreed ratios on the basis of equipment for a certain number of lines during a period of four years. A fifth firm was included later in the agreement.

Standard rates of charge were agreed upon, but owing to developments many of these required considerable adjustment during the period of the agreement.

IX.—*Bulk Telephone Equipment Agreement.*

The following is an extract from "The Revenue Department's Appropriation Accounts for the year ended Mar. 31, 1929, together with the report of the Comptroller and Auditor-General," which also appeared in *The Times* of Jan. 25, 1930:—

"In the opinion of the Postmaster-General the reductions in the price of telephone equipment made in recent years have not been so great as should have been possible. Although, with a view to obtaining competition, Post Office orders for exchange equipment have been placed for the last three or four years on tenders for individual exchanges submitted by the five firms, experience has shown that the prices obtained were not in reality competitive and that the system of tenders for individual exchanges had other drawbacks which tended to inflate costs.

"Negotiations were therefore opened, and after long discussion an understanding was reached under which practically all Post Office orders for such plant from January, 1928, to March, 1933, are to be given to the five firms already referred to, who are to allocate the orders among themselves at uniform prices."

Certain details of this agreement are under final negotiation between the parties, and therefore only the above brief extract from a public official announcement, relative to the agreement, has been made.

X.—*Statutory Powers and Liabilities of the Postmaster-General under (a) The Telegraph Acts, and the Liabilities which fall upon the Department's Contractors.*

Some of our most important contracting problems affecting conduit-laying and cabling works fall under this heading. Three parties at least are involved in connexion with liabilities imposed by the Telegraph Acts, and many of the Highway Authorities are practically a law to themselves.

Contractor's indemnity to Postmaster-General.—The Department's street works are performed under powers conferred upon the Postmaster-General by the Telegraph Acts, and contractors are required under their contracts to undertake liabilities imposed by these Acts and by other public law. Contractors also indemnify the Postmaster-General against all claims, &c., which may be made and costs incurred by them under these and other general liabilities.

Many Highway Authorities refuse to deal directly with contractors, and in such circumstances difficulty and delay are caused by the Department being compelled to act as intermediary.

Opening Ground and Filling-in.—The Postmaster-General has power to open ground under certain safeguarding conditions as to traffic and other matters, in order to lay ducts for his purposes. Highway Authorities have not powers to open ground for the Postmaster-General's works, but they may if they elect, fill in the trench after the duct has been laid, in addition to reinstating the pavings disturbed, and charge the cost incurred to the Postmaster-General. The condition permitting them to fill in the trench is unsatisfactory, as it involves divided responsibility for damage to the Department's duct line, and increases the cost and risks of the works (a) by necessitating two gangs of men being employed for the trench work; and (b) by changing over the arrangements for fencing, watching, lighting the work. In practice this procedure is rarely suggested by Highway Authorities, and the Department's contract forms are drawn in accordance with normal procedure.

Reinstatement of Pavings: Conditions and Charges of Highway Authorities.—The Postmaster-General is liable to restore pavings disturbed

only to a condition equal to that in which they were before interference, but not to improve the surfaces. Contractors call attention to demands for additional concrete for consolidation, to charges for excessive widths restored, or to improved types of pavings substituted, or to excessive periods for consolidation before permanent reinstatement is allowed, as such demands would be outside their contract price. In such cases the Department stands behind the Contractor, and will either assist him or take over negotiations from the outset. These demands are an everyday feature of underground work. It is, of course, recognised that once certain types of road crust have been disturbed, they can only be restored to approximately their previous condition by very efficient methods of consolidation or by the addition of hard material or concrete.

A general agreement has been arrived at recently between the Post Office and the Association of Municipal and County Engineers who act for their respective Highway Authorities, in reference to many problems associated with the reinstatement of trenches opened by the Department and its Contractors. This agreement facilitates uniformity of practice, and has helped to settle many difficulties.

Damage: Negligence.—The Postmaster-General must meet the cost of all damage done in laying his mains, regardless of the question whether such damage was due to negligence or not. Some years ago a house front near a Post Office contractor's trench fell down, leaving rooms exposed, the brickwork being of faulty construction. The damage was held to be due to the trench work, and the accident cost the contractor a large sum. We have many cases in which the Department's contractor is so unfortunate as to give the last flick to some faultily built wall, and notwithstanding that the wall may have been on the point of collapsing, the onus of dealing with the liability rests upon the lastcomer.

A contractor in laying ducts unwittingly caused water to flow along his trench away from a spring from which watercress beds were previously supplied, and he had to meet the liability incurred.

As a matter of precaution, contractors, when working in narrow streets or near tall or old buildings, are careful, in their own interests, to make notes of visible defects or take photographs of the property before they open ground.

Liability of Postmaster-General for Damage is of a continuing nature.—Liability for damage caused by reason or in consequence of Post Office road works is under the Telegraph Acts, of a continuing nature, and if after the expiry of the maintenance period of six months, following satisfactory completion of the work, damage to property, e.g., sewers, mains, cellars, houses, or in some cases to the road itself, can be traced definitely to the contractor's operations, the Postmaster-General's liability in this respect, falls to be borne by the contractor. In cases of damage the contractor is at once called in to deal with the complaint and given an opportunity to inspect the work. Failure to notify the contractor may prejudice the Department's position. The complainant is notified that he should look to the contractor concerned to deal with his representations.

Contractors Relief from Liability for Damage in certain cases.—A contractor has the right under his contract to appeal for relief from liability if, during the course of the work, he has reason to consider that the position of the trench as marked out for him by the Department may cause damage. Such an appeal must, however, be made by the contractor before the work at the place is actually begun, i.e., before damage is caused, as afterwards it cannot be entertained.

Gas and Electric Mains—Explosions—Parties Concerned.—Cases of damage occur involving several parties and developments are interesting. Post Office plant *in situ* may be damaged by an explosion of gas or a leakage of water. After presentation of a claim against the Gas or Water Company, the latter's investigations may lead to an allegation that the liability was that of a Post Office contractor alone, or conjointly with some other undertaker, who in laying a conduit at a previous date, damaged or caused the Company's main to subside, resulting in the leakage complained of.

Electric mains of old types also have, when damaged, been the cause of serious explosions. Water has gained access, gas has been generated and has accumulated in cellars. The owners of such mains, naturally forewarned, keep a keen lookout for the hapless road contractor who last opens a trench near these mains. The mains may actually not have been touched by the contractor's operations, but if the latter can be held to have contributed to the removal of the supporting earth causing subsidence, the contractor may become liable in the event of the joints breaking and water entering. In all such cases, however, it is usually a difficult matter definitely to prove that the damage was caused by a particular contractor's operations.

Injury to Person.—Liability for injury to third parties as a result of the Postmaster-General's works also rests upon contractors who insure against this risk. Apart from the numerous small cases in which pairs of trousers are damaged by their occupants falling into holes in the footway, or of old ladies tripping over temporarily restored flagstones which may project a little, serious accidents happen not infrequently. Not long ago a motor cyclist, travelling at high speed, met his death owing to a skid, and it was endeavoured unsuccessfully to attribute this skid to a trench which had been opened by the Department's contractor across the road, about 50 yards from the place where the skid actually began. The roadway had been satisfactorily reinstated by the contractor.

(To be continued.)

TELEGRAPHIC MEMORABILIA.

THE bouquets which reach Government Departments are few, so that although it is not the Post Office which is the recipient in the present case, one cannot refrain from quoting the *Electrician* in its defence of The Department of Overseas Trade. The latter had been severely criticised in an article which appeared in its pages and which the editor had handed over to the D.O.T. itself. As a natural sequence of this courtesy, the reply of the department was also duly published in the same journal. Commenting on the result in an editorial, the *Electrician* concludes thus: "Whatever the judgment of our readers as to whether the Department is or is not of any use, we contend that the D.O.T. is at least the only impartial clearing house for Dominion and foreign commercial information, making it available to all who produce and sell British goods, and if it is not so effective as it should be, it is because it is not receiving that support from trade and industry to which it is entitled and which they are able to afford." Grateful thanks to our respected contemporary!

Companies.—An agreement has been reached between the Marconi International Marine Communication Co., Ltd. and the Chamber of Shipping of the United Kingdom and the Liverpool Steamship Owners' Association with regard to the terms under which the Marconi Marine Company is prepared to carry out marine wireless on British ships in the future. As a part of this arrangement the Marine Company has appointed Mr. A. Shaw, who is deputy-chairman of the P. & O. Steam Navigation Company, to its board. Mr. Shaw is also a director of the Bank of England. The Globe Telegraph & Trust Co., Ltd. directors, according to the *Financial News*, in declaring the usual quarterly interim of five shillings per share net on the ordinary shares, state that unless an improvement occurs in the company's income, it will not be possible to maintain this dividend. At the second annual general meeting of Radiovisor Parent Ltd., the chairman, Lt.-Col. the Hon. A. C. Murray, C.M.G., said that "The Radiovisor Company was engaged in launching a new industry, and occupied to-day a pre-eminent position in the light-sensitive world."

Personal.—Sincere congratulations to Mr. J. H. Roebuck upon his promotion to the rank of Assistant Superintendent Telegraphs (Cable Room).

All old friends and colleagues will be relieved to learn that Mr. A. Tapley (formerly Asst. Controller of Cable Room, C.T.O.), is recovering, though slowly, from the accident which occurred about two months before Christmas. As those who know him well would have expected, he writes quite cheerfully and hopefully from the hospital where (mid-December) he has been "lying on his back with the right leg tethered for nearly eight weeks." Yet on a certain visiting day one would have found him conversing with an esteemed friend with his wonted intense interest on—Schubert's life!

On Nov. 19 came the signal from Clacton-on-Sea that Sam Treby (S.J.T.) had safely scored his eightieth year!

Although it was a gathering for "women only," this writer is able to report that the function held on Nov. 18, at the Sunday School Union, of the Women Supervisors of T.S., when the opportunity was taken of entertaining their predecessors, was a complete success. The idea was an excellent one, and Miss Riminton and those associated with the organisation of the event, are to be congratulated upon, to quote the words of a male eavesdropper, "the splendid time" which all concerned experienced. Another male reporter gives the information that the gathering was under "the charming aegis of Miss Gertie Hall."

It may be opportune at this point to state that the New Year's gathering of the male pensioned officers of the G.P.O. West, will take place at the usual Dairy on the 14th inst.

Not only has Torquay its circle of ex-C.T.O.-ites but, judging from the public press of Bournemouth, the latter and its environs is able to give a good account of the activities and well-being of a goodly number of old colleagues. The bowling prowess and activities of Messrs. E. Lack and E. J. Eldridge, formerly of the Engineer-in-Chief's office, may be measured by the fact that in one single issue of the local *Times and Directory*, their combined names were mentioned no less than eight times. Jack Hopgood, an old original member of the A. P. Corp, which went out to Egypt under the late W. Parish is also a denizen of Pineland!

J. J. T. much appreciated the invitation to the "Fortels" Smoker and Presentations on Nov. 21 to those worthy recipients in the fields of sport, and the not lesser worthy officers, Messrs. Bird and C. Barrett, who received very tangible tokens of respect and affection upon their retirement. As this item will no doubt be dealt with more adequately elsewhere, these few lines shall suffice.

Obituary.—The death is announced at Vancouver on the Oct. 3 last of Miss Annie Moore, formerly Chief Supervisor, C.T.O. Miss Moore died of pneumonia after but two days' illness. It will be remembered by her more intimate friends that she migrated to New Westminster, B.C., on her retirement in 1921 to join her younger relatives there. Deceased was much respected, and if the writer is not mistaken, was one of the early Female Test Officers in the old "Met."

Also on 8th ult. at Crouch Hill, Miss F. A. Fearon from acute rheu. arthritis. The deceased lady entered TS in 1871, became Asst. Supervisor in 1897, and retired in 1911 on account of ill-health.

Countries.—AUSTRALIA.—By the time these lines are printed, according to Reuter's Sydney Agency, direct telephonic communication should be an accomplished fact between Adelaide and Perth. This has been made possible by utilising the existing pair of copper wires of the overland telegraph system, a "carrier" circuit now being added. BELGIUM.—A local law passed by the town of Cincy now compels all owners of electrical machinery to provide the necessary apparatus to prevent interference with wireless transmission. The penalty for infringement is a fine of 5 to 15 francs for each offence or imprisonment within the limit of seven days. BULGARIA.—The new wireless station of Sofia is daily expected to commence regular operation, according to *The Electrical Review*. CANADA.—In an address to the London (Ontario) branch of the Engineering Institute of Canada, recently reported by Reuter, Mr. R. B. Steele, assistant chief engineer of the Canadian National Telegraphs, stated that telegraph transmission at a greater speed would be made possible in the near future by a further extension of the carrier-current system. In 1927, by means of this system the Canadian Telegraphs increased the carrying capacity of a single pair of wires from a comparatively small number of words to 4,120 words per minute. Recent figures published by the Canadian Dominion Government for the first seven months of 1930, disclose the curious fact, says *World Radio*, that "whereas almost every other city in the Dominion recorded an increase in the number of wireless receiving licences, as compared with the whole of 1929, Montreal dropped from 43,054 to 30,015." From the same source we learn that there is more than a probability that a new broadcasting station is to be built at North Bay in the near future. An application has been made to the Dominion Government for a licence, which is strongly supported locally. The studio would be located in the Capitol Theatre buildings. It is to be a 50-watt station, originally CKNC, Toronto. The Council of Brockville has made it compulsory for all electric signs to be equipped with protective devices against interference with receiving sets. CHINA.—The new arrangement between the Chinese Government and the Great Northern and Eastern Extension Telegraph Companies, whose rights expired on Dec. 31 last, were still under discussion when these lines were written, according to the *Electrician*, which understands that "the Chinese telegraph administration proposes to transmit all possible messages abroad by wireless, unless the

sender in China specially indicates that he wishes his messages to go by cable. The new wireless station in the vicinity of Shanghai was formally opened on Dec. 6 last. Further information regarding this station is contained in another communication, this time from Reuter's Shanghai agency, which states that the new station has been two years under construction and is fitted with up-to-date sending and receiving equipment. It is situated just outside Shanghai, but the control of the station is in the heart of the business section of the international settlement. It works in co-operation with the Radio Corporation of America which has established a similarly powerful station in San Francisco. Reuter's agent in Nanking gives the following interesting information regarding the situation and says: "The spokesman of the Ministry of Communications has made a statement on the present situation regarding the negotiations between the Chinese Government and the foreign cable companies (Eastern Extension, Great Northern, and Commercial Pacific) whose contracts with China expire at the end of the year. He said that the new radio station at Shanghai made possible, direct communication with America and Europe, and the Ministry had arranged for the payment of China's debt of nearly 5,000,000 dollars to the cable companies. In the event of the present negotiations breaking down, the Ministry was fully prepared to handle all outgoing and incoming messages. The issues now being discussed between the Government and the companies were: first, landing rights; secondly, the future interests of the companies in China; and, lastly, cable rates. The cable companies desired a twenty-years extension of their monopoly of landing rights, to which the Chinese Government could not agree, though it was willing to discuss a shorter period. The Government insisted that the Chinese Telegraph Administration must handle all incoming and outgoing traffic in China, to which the companies objected on the ground that the Chinese Administration would unduly favour the Chinese-owned radio station. The Government's reply was that it appreciated the importance of the cables and would protect the companies' interests. Finally, the Government was holding out for a bigger increase in the proportion of the cable revenue payable to it than the companies had yet offered." The further news, this time regarding the telephone situation, was to the effect that "In a communication to the Ministry of Foreign Affairs, the Chinese Ministry of Communications requests that the consular body in Shanghai be immediately notified to instruct the foreign telephone company to remove its telephone lines from territory outside of Settlement limits! Despite the restricted space available, it has seemed well worth while to avoid condensation, as far as possible, with regard to the present very interesting happenings in China. CZECHO-SLOVAKIA.—Direct wireless communication between Prague and New York was inaugurated on Dec. 1 last, by an exchange of telegrams between President Masaryk and President Hoover. The Czechoslovakian Ministry of Posts and Telegraphs, reports the *T. and T. Age*, has a plan under consideration for putting up a new line between Prague and Olomouc (formerly Olmutz). Work on the line will be commenced early in the present year. In this same energetic little country it is also noted that the number of broadcast receiving licences is still well on the increase. The latest figures for 1930, January to September inclusive, show 18,990 more than for the corresponding period of 1929. FRANCE.—The Société Electro-Cable reports that the first stage of extensions at the Argenteuil works has been completed. The new cable factory will probably be in operation this year. GERMANY.—The Königsberg wireless station changed its wavelength to 217 metres (1,387 kc/s.) when the high-power Heilsberg station began to operate last month on Königsberg's old wavelength, 2,765 metres (1,085 kc/s.). Both stations will transmit the same programme, and the new station's power of 75 kw. is to be gradually increased to 120 kw. GREAT BRITAIN.—Listeners of the London Regional programmes have been somewhat disturbed by the interference caused by the new German station at Muhlacker, near Stuttgart. The wavelength separation between the two stations is that agreed to internationally, and both stations are operating on their legitimate wavelengths. "The matter has been discussed with the foreign broadcasting authorities concerned," says *The Electrical Review*, "meanwhile

the German authorities, it is understood, have promised every possible precaution against over-modulation." *Transatlantic Communication*.—The erection of 20 additional masts at the transatlantic receiving station at Kemback, Cupar, Fife, Scotland, has been completed, and probably by the time these lines reach our readers the ten new aerials will have been joined up to the switchboard. The *Daily Telegraph's* Glasgow correspondent reported last month that "Great possibilities are expected from a 'talking beacon,' invented by the engineers of the Clyde Lighthouse Trust." Summarised, the idea is that of a gramophone record automatically calling the name of the lighthouse to which it is allocated. The record being radio-transmitted during the brief intervals between the auditory fog signals. The apparatus has actually been experimented with at the Trust's lighthouse on the island of Cumbræ, Scotland, and as recently as last month was accepted as "satisfactory" by the committee. The engineers, however, are apparently determined to make assurance doubly sure and desire continued tests covering several more months. The Secretary of State for Scotland, Mr. W. Adamson, speaking at the annual dinner of the Radio Manufacturers' Association in London recently, said that there were now 3,250,000 licences issued, representing a listening public of 13,000,000. The Treasury benefited to the extent of £300,000, while the capital involved in the activities of the Association alone represented no less a figure than £80,000,000. "Ten years after its inception," said the speaker, "England, to-day, had a broadcasting system which was the envy of the world." **IRISH FREE STATE**.—The construction of a wireless direction-finding station at Mizen Head, County Cork Coast, is nearing completion. "An unusually tall mast," says *The Electrical Review*, "over 300 feet above sea level, has just been erected there." It is the most westerly station of its kind, and should certainly prove of the highest utility to vessels in the Atlantic. **MANCHURIA**.—The Mukden Board of Communications is gradually reorganising the telegraph and telephone services throughout Manchuria, which were formerly more or less under local control. They will eventually all be under the unified direction of the above-mentioned board. Additional long distance lines are to be erected, and it is understood that developments as regards the telephone service will be in the direction of automatic systems for Harbin, Mukden, and similarly important centres. **RUSSIA**.—Reuter's Moscow agency states that a direct radio service was to be inaugurated between Russia and the United States a few weeks back. *The Electrical Review* states that the People's Commission of the Soviet Post and Telegraphs has drawn up a five years' plan for the construction of 62 more broadcasting stations, as the result of which it is hoped to increase the number of receiving instruments in use to no less than 14 millions. **SCOTLAND**.—The British Broadcasting Corporation's new regional headquarters were officially opened on Nov. 29, the ceremony being broadcast by all the Scottish stations. "Broadcasting House" is in Queen Street, Edinburgh, and the building contains the largest studio in Britain at present in use. It has a remarkably fine theatre in which a large audience will be able to watch as well as listen from the galleries and the floors. **SOUTH AFRICA**.—By arrangement with the S. African Government cable and radio rates have been equalised, and it is expected that shortly a similar arrangement will be concluded with respect to the Indian and Australian traffic. **SOUTH AMERICA**.—Reductions in telegraph rates became effective on Dec. 1 last by Imperial & International Communications, Ltd., the Commercial Cable Co. and the W. Union Telegraph Co. Also on the same date the tariffs were reduced for several Central American companies. **SWEDEN**.—The receiving licences in Sweden up to Sept. 30 last numbered 466,750, an increase of 5,134 during the quarter ended with that day, and the total corresponding to 76.8 listeners per 1,000 inhabitants. **U.S.A.**—The United States Circuit Court at Philadelphia is reported to have reversed a ruling made a year ago, that the patents regarding wireless valves owned by the General Electric Co. were invalid. The decision gives the company an absolute monopoly of its type of valve for the next twelve years, to the exclusion of the plaintiffs, De Forest Radio Co. If the decision is upheld by the Supreme Court, to which it is almost certain to appeal, it will enable the General Electric Co. to recover royalties from manufacturers who

have been making its type of valves for the last five years. *Head-phones*?—According to the Department of Commerce, Washington, there are approximately 13,500,000 broadcast "radio-telephone" receiving sets in use in the United States. The Radio Corporation of America commemorated its tenth birthday in November last. The *T. and T. Age* informs us that "The Stenode Radiostat," invented by Dr. James Robinson of England, formerly of the British Air Ministry, demonstrated about two months ago in the Engineering Auditorium, New York City. His receiver claims to make it possible to operate wireless broadcasting stations closer together on wave lengths than hitherto possible. Two hundred persons were present. The local N.Y. station WOR was utilised for the experiments, which were first made on an American designed broadcast receiver and then on the Radiostat. So far as one could gather from the brief report, the results were indecisive. *Teletype progress*.—From the columns of the same interesting fortnightly periodical we learn that the "Bell" system has been giving telephone-typewriter service over leased wires with considerably more than 10,000 machines in use. *Rosh Hashana*.—During the celebration of the Jewish New Year in the U.S.A., in September last year, the Western Union Telegraph Company made a concession to their Jewish clients, and delivered all their telegrams unsealed during the festival. It appears that the tearing of paper is forbidden on such occasions by rabbinical law. *A propos* of the mention of the "Bell" company above, it is interesting to learn that the American Telegraph & Telephone Co. recently purchased the Teletype Corporation of Chicago by the exchanging of 150,000 shares of common stock of the two corporations, share for share, in October last, when the deal became effective. The "Bell" system, it appears, is recognised as the best customer of the Teletype Corporation, and it is expected that the former company will take the major portion of the Teletype's production for some time to come. The "Teletype" is to be operated as a subsidiary of the Western Electrical Corporation.

Broadcast Programme Making.—Programme making is unbelievably difficult, and we should remember that; giving thanks for the happy times when the touch is sure and satisfying.—*The Observer*. J. J. T.

FOR OUR ADVERTISERS.

ALL enquiries should be addressed to the Department of Overseas Trade, 35, Old Queen Street, London, S.W., quoting reference number in all cases. Supplies, &c., required by:—

Australia.—Melbourne, P.M.G.'s Dept. Jan. 13. Supply of one to four sets of echo-suppressors for use on two-wire circuits, equipped with 22-type repeaters (Ref. A.X. 10523). Also Melbourne, same department. Jan. 20. Telephone switchboard keys and parts (Ref. A.X. 10517). *New Zealand*.—Wellington P. & T. Jan. 19. Electric lamps and condensers (P. & T. 151/2606). (Ref. A.X. 10446). Also Jan. 20. Resistance spools (Ref. A.X. 10505). Also Jan. 24. Supply 300 four-conductor dial cords (Ref. A.X. 10556). Also Jan. 26. Supply 500 ebonite telephone earpieces (Ref. A.X. 10555). *Australia*.—Melbourne, P.M.G.'s Dept. Jan. 27. Supply telephone jacks and number plates (Ref. A.X. 10544). Also same place and date. Supply various kinds fuses and heat coils for protection telephone equipment (A.X. 10516). Also same place and department. Feb. 3. Supply of telephone exchange power boards (Schedule No. C. 665) (Ref. A.X. 10466). Also Feb. 10. Supply telephonists' telephones for common battery working (Ref. A.X. 10569).

A confidential report by the Department of Overseas Trade on the market for radio apparatus in Jugo-Slavia is available to United Kingdom firms desiring such information. Further enquiries should be made by qualified enquirers to the above-mentioned Department at 35, Old Queen Street, London, S.W.1 (Ref. B.X. 6874).

Another confidential report is available at the same department with special reference to the wireless apparatus market in Malaya, and has been prepared from information received by H.M.'s Trade Commissioner at Singapore. Applications should be made to the same address but Ref. B.X. 6799 should be quoted.

A branch office of His Majesty's Trade Commissioner's Office in the British West Indies will be opened in Jamaica early this year. Mr. Massie-Blomfield, M.A., has been appointed to take charge of the new office.

J. J. T.

WIRELESS: THE REAL PROBLEM.

B. S. T. WALLACE, C.T.O.

So many questions continue to arise and repeat themselves concerning what might be termed the life blood of wireless receivers—the various batteries—that a general review of the problem may prove instructive.

When broadcasting first appeared on the horizon the valves then available required as much as 1 ampere at 6 volts for the lighting of the filament, while the high tension current was in the neighbourhood of 2 or 3 milliamperes at a voltage frequently as low as 24 volts.

The real "problem" in those days was filament current. The transport of the usual 6 volt 40 ampere-hour accumulator to a comparatively distant charging station was always the little nightmare of reception. The high tension was considered no difficulty, it being easily supplied by connecting a group of flash lamp batteries, the only cheaply convenient method then available.

The first rumours of dull emitter valves were hailed with great joy and it was considered a wonderful achievement when the filament was reduced to .25 of an ampere even at £2 a time! But real satisfaction was not felt till the arrival of the .06 type, which could be operated with dry cells or primary batteries.

Now the pendulum has swung in the opposite direction. The L.T. is thrown at us at every street corner and the H.T. has become the real problem.

Some may consider that all-electric operation is the ultimate solution to the difficulty, but for the present discussion this can be dismissed. It is a very long way off for the great majority and in many directions it has its own peculiar difficulties, evidenced even in progressively electric America, where battery driven receivers are still very much to the fore.

Filament lighting is more or less established to well under half an ampere for most of the popular receivers.

Where charging facilities are available an accumulator best meets this requirement but it is not the only means available. In isolated localities an alternative worth consideration is the large type of Sack Leclanche cell made by Messrs. Siemens, which is capable of running the filaments of a three-valve receiver for nearly twelve months without any attention.

Accumulators frequently prove a source of annoyance to their owners due to improper usage by them or the charging station. They are best kept in condition by continual movement, electrically speaking, i.e., they should always be charging or being discharged. Any accumulator at rest is nursing trouble to some extent. A wireless receiver calls for intermittent use, which makes it particularly important that the accumulator be charged immediately it approaches a discharged condition. The best plan is to calculate the time it should last with the fullest use, allow a margin, and have it charged regularly at that period whether discharged or not.

Twenty actual ampere-hours should be the minimum capacity of cell employed because many charging stations will not trouble to give the proper charging rate of half an ampere to the small cells, with the result that the positive plates are soon broken up and the old story comes up after a few months, "Your plates are worn out. May we renew them?" whereas they should last for seven years.

The prevalence of improper charging is well illustrated by the following true story. A lady took her accumulator to a charging station in South London which for 30 years has been run by one of the greatest experts on storage cells. When it was handed to her after charging, she coldly asked, "Has this been done?" Much taken aback, the proprietor replied, "Certainly, why do you ask?" "It's quite cold!" exclaimed the lady. Further questioned, she vouchsafed the view that "at all the other places" where it had been charged

it was "always nice and warm"! Accumulators should never indicate any very appreciable rise in temperature. It is a sure indication that damage is being done. Always insist that the maker's charging rate and instructions are adhered to.

The cheap and economical supply of high tension is becoming an increasingly difficult problem. In some quarters it is asserted that "quality" is unattainable with less than 500 volts at 50 milliamps. There are just as many others who can readily demonstrate that 5 milliamps at 100 volts can also do wonders.

Most listeners are bound to their peculiar receiver. As the trend of the popular type is a three valve instrument utilising a screened grid valve the requirements are a constant H.T. of at least 100 volts and capable of a 10 to 15 milliamp. discharge. With a screened grid valve it is imperative the voltage be maintained, otherwise it may become inoperative. Other valves can still make a show down to 60 volts, but not so the screened grid. This is the modern problem.

The ideal H.T. is obtained from accumulators. They give constant voltage with no material internal resistance, and a perfectly silent background. It was a matter of some comment that the B.B.C. used this form of H.T. at the Radio Exhibition, but they evidently wished to incur no risks and used the best thing available.

The principal advice one can give with regard to this form of battery is to avoid any temptation to use small cells. Let 5,000 milliamperes-hours be your standard or leave them alone. The difficulties of smaller cells are too numerous to detail here.

One firm in 1929 made a turnover of £250,000 in dry cells for H.T. purposes and there is no question this is the most widely used form of battery. The fact that a world-wide organisation like Messrs. Siemens have placarded the hoardings of England with their new form of H.T. battery is sufficient evidence of its importance. The containing zinc vessel of this new Siemens battery consists of a one-piece stamping—a remarkable advance on the old soldered containers which gave rise to so much local action and reduced the life of the battery.

Dry cell H.T. batteries should be of adequate capacity for the work they are called upon to do, otherwise the voltage will fall and the internal resistance rise too quickly. Some measurements made on 60-volt H.T. units show an internal resistance of 10 ohms when new, rising to as much as 1,000 ohms when the voltage has dropped to 45 volts.

The other point is to ascertain if the battery is comparatively new when purchased. Dry cells commence to deteriorate immediately after manufacture. *A shop voltmeter test is no guide whatever to the condition of an H.T. battery.* It may drop to 20 volts the very next day. If you cannot trust your dealer send direct to the makers for your battery.

A very interesting fact not generally known is that a dry cell battery in use at its normal economical discharge rate will fall comparatively steadily in voltage from week to week. If the same battery is left and not utilised at all the time will come when its voltage also will drop, but it will *not* do so gradually. The fall takes place with remarkable suddenness.

This fact is of vital importance where grid bias batteries are concerned. The failure of these may ruin both H.T. and valve. After 6 months it is useless to rely on a voltage test for their condition. Change them. If they must be nursed longer, test them on a heavy load, such as a flash lamp bulb, for several seconds. The writer has known a grid bias battery to give a full voltage reading one day and to fail the next day to move the voltmeter needle, despite the fact that no current had been taken from it.

Many alternative sources of H.T. have been attempted and actually marketed, but with doubtful success—at least from the point of view of economy and efficiency.

All centre on obtaining the H.T. from the L.T. battery, which, of course, would be the ideal method. It is rather annoying to

know that the actual power required for the H.T. is only equivalent to another half-ampere taken from your accumulator.

These other sources of H.T. include motor generators run from the L.T. accumulator; voltage transformers operated by make-and-break contacts and subsequently rectified by a valve; H.T. accumulators with parallelling switch for charging from L.T.

The expense and a certain amount of worry rule these things out for most people, but they are interesting for those with plenty of money and time on their hands.

There is occasional talk of cold valves. They are not urgently required. The infinitely more pressing problem is the abolition of the need for high voltages.

REVIEWS.

"Telephone Theory and Practice. Theory and Elements." By Kempster B. Miller, M.E. Published by McGraw-Hill Publishing Co. xiv + 486 pp. Price 25s. net.

To those readers who were studying telephony at the beginning of the present century the name of Kempster B. Miller will be familiar as the author of what was then the standard text-book on the subject—"American Telephone Practice." The development of the art since the last revision of this work 26 years ago has put it completely out of date, but fortunately for the present generation of students of the subject, Mr. Miller has decided to bring out another monumental work covering the whole of the field of telephony as it exists to-day.

This work will be issued in three volumes. The present volume deals with the theory of the transmission and reproduction of sound and with the elements of the modern apparatus by which these results are brought about. We need not specify in detail the various points with which it deals, it will suffice to say that the whole ground is covered with great thoroughness.

The book is fully illustrated, the diagrams, line drawings and photographs of apparatus being excellently reproduced. It will certainly take its place as the present-day standard text-book of that portion of telephone engineering with which it deals.

The remaining volumes by which the work will be completed will deal respectively with the Telephone Exchange, and with Lines and Transmission.

"Testing Radio Sets." By J. H. Reyner, B.Sc., A.C.G.I., D.I.C., A.M.I.E.E., M.Inst.R.E. Published by Chapman & Hall. vii + 178 pp. Price 10s. 6d.

Anyone who has to do with radio sets, from the professional designer and constructor to the amateur, should have at least some knowledge by which the various component parts and complete sets can be tested, and the cause of any failure in performance located.

The present volume admirably fills the need for a comprehensive work to which all, amateur and professional alike, can turn for information on this subject.

The book is divided into two sections—fault testing and laboratory tests. After a brief introduction and a chapter on general testing methods, there follow chapters on low frequency tests, tuning tests, high frequency tests and the testing of mains apparatus. The section on fault testing concludes with two chapters dealing respectively with special tests and the location of some curious faults.

In the section on Laboratory Tests a brief outline is given of the methods adopted for testing receivers, both in the research laboratory before the design is completed, and in the works laboratory during the process of production.

The book is very well got up, with excellent reproductions of photographs of apparatus. It should form part of the library of everyone in any way concerned with the construction or maintenance of wireless sets.

"Easy Lessons in Television." By R. W. Hutchinson, M.Sc. Published by the University Tutorial Press, Ltd. vii + 175 pp. Price 1s. 9d. net.

We recently noticed in this journal two elementary books on general wireless telegraphy by Mr. Hutchinson. The present book is written in the same simple style, and with the same lack of assumption of any knowledge of mathematics or physics on the part of the reader, so that it is suitable for anyone with absolutely no previous knowledge of the subject. The whole ground is covered, elementary electricity, elementary optics, the thermionic valve, wireless receiving sets, transmitting and receiving apparatus for television, tele-kinematography, tele-talkies and telephotography. The book is profusely illustrated with excellent diagrams and reproductions of photographs, and we can strongly recommend it as a very readable introduction to a most fascinating subject.

"Algebraic Charts." Designed by Edgar Dehn. Published by the Oxford University Press. Six charts in cardboard case. Price 3s. 6d.

These charts have been prepared to enable the approximate values of the roots of equations to be rapidly obtained.

The set consists of six charts designed to give the roots of quadratic, cubic and biquadratic equations.

The charts are well reproduced on thin millboard, and should prove of great utility to engineers and others whose work requires the frequent solution of complicated algebraic equations.

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

In accordance with the announcement made in our December issue, the following question is set for solution by readers. A prize of a book will be awarded for the best answer, which should reach the Editor by Jan. 31. The correct solution will appear in the March issue.

QUESTION FOR JANUARY, 1931 (TELEGRAPHY).

Compare the current values in (a) the battery, (b) the compensation circuit on a double current differential duplex circuit when the batteries are (a) in combination, (b) in opposition on the line. It may be assumed that secondary cells are employed.

SOUTH DEVON RETIRED POSTAL AND TELEGRAPH OFFICIALS REUNION.

THE annual reunion of the retired P. and T. officials residing in Torquay and the surrounding district, took place on Friday evening, Nov. 14, at Callards Cafe, Torquay. Mr. Hamblen, late Postmaster of Torquay, occupied the chair. There was a goodly number present, including visitors from Newton Abbot, Paignton, and environs, the C.T.O. being represented by Messrs. C. H. Honeysett (late Postmaster of Henley-on-Thames), J. Slade, and F. T. Wadley (late Asst. Controller, Foreign Telegraphs). There were also present Messrs. C. T. Row, Lancashire, and Shields, from sections of the L.P.S., London.

The loyal toast having been drunk, the Chairman referred to the loss sustained during the past year by the death of Mr. Collyhole, late of Torquay P.O., the founder, and of Mr. J. B. Murray of the C.T.O., to whom reverent, silent tribute was then paid by the company standing.

Supper over, several short speeches were made, including one by Mr. Slade on the grievances of pre-war pensioners. "Auld Lang Syne" brought a happy gathering to its close at 10 p.m., thanks being given to Mr. A. Simmonds for the excellent arrangements.

J. J. T.

LONG DISTANCE TELEPHONY.

J. F. DARBY (*Headquarters Traffic Section*).

(II.)

IN a previous article various methods of trunk operating were mentioned; these methods will now be treated in more detail and some indication given regarding the possible developments and modifications which they may undergo in their application to the different types of calls dealt with under the British telephone system.

It will perhaps be advantageous, at the outset, to classify the various kinds of *trunk* calls, i.e., non-local and local junction, to which reference is, from time to time, made.

I. No-delay Traffic.—Calls, to points beyond the second fee area of the originating exchange, routed over circuits provided on a basis which admits of connexion being set up without delay at all times of the day. Over the shorter distances these calls are not strictly timed (although in special circumstances, and for special types of calls, strict timing may be undertaken) and the traffic is classified under two heads:—

- (a) untimed no-delay traffic, and
- (b) timed no-delay traffic.

The term 'Toll' is, in certain cases, applied to the calls coming under category (b) but, as the term is not in universal use and in order to avoid confusion with the American term 'Toll' (applied to long distance traffic), the use of the term will be avoided as far as possible.

II. Delay Traffic.—Calls routed over circuits *not* provided on a basis which admits of a no-delay service at all times of the day, but which necessitates, during certain periods, the disposal of the traffic, call by call, with some measure of delay.

The classifications are:—

- (a) Inland. Calls circulated between points within Great Britain and Ireland* over delay routes.
- (b) Overseas. Calls circulated via an international *tête de ligne* for the purpose of routing and control. They are sub-divided into:—
 - (i) Continental. Calls between Great Britain and the Continent of Europe and also calls between certain Continental countries switched via London (for example, Denmark to Spain).
 - (ii) Inter-Continental. Calls between Europe and other continents switched via London; also calls between certain continents switched via London (for example, Australia to America).
 - (iii) Ship-Shore. Calls between Europe and ships at sea (at present limited to ships in the North Atlantic).

As regards operating procedure, it is, of course, obvious that a uniform working cannot be applied to calls *I (a)* and *II (a)* or even *II (a)* and *II (b)*, and the problem with which we are concerned is to devise and organise the most suitable operating methods for each class of traffic, having regard to the particular circumstances involved.

Reference to no-delay working is included in these articles on Long Distance Telephony for two reasons: (i) the transfer of trunk routes from a delay basis to no-delay basis which is continually taking place, and (ii) the part which no-delay working plays in the completion of long distance connexions.

Systems of Operating.—(1) *Trunk Operating on a No-delay Basis.*—This system of working is identical with local junction

* The Administration of the telephone service of the Irish Free State is entirely separate from that of the British system, but, by agreement, a common procedure is in operation regarding the control of traffic.

operating except as regards timing procedure. The subscriber remains at the telephone and the required connexion is set up without delay. Calls are controlled by the local exchange A operators and routed to B operators at other local exchanges. (This gives rise to the American term A-B traffic.) The trunk circuits are multiplexed in front of the A operators and are provided on a junction basis. (This has already been defined.)

Automatic signalling is the standard facility, and considerable importance attaches thereto. The fullest facilities provide for automatic calling and clearing over the trunk circuits with 'through supervision.'

In order to make this clear, the arrangements provided for Signal Working (see later) on a full automatic signalling system are given below:—

- (a) When a trunk circuit is picked up in the outgoing multiple, a calling signal (associated with the trunk circuit in question) is operated automatically on the distant B position.
- (b) The supervisory signal associated with the calling cord at the distant B position with the called subscriber's circuit and persists until the subscriber answers, when it is again restored to normal.
- (c) This signal re-appears when the trunk circuit is connected at the distant B position with the called subscriber's circuit and persists until the subscriber answers, when it is again restored to normal.
- (d) The signal reappears finally when the called subscriber replaces his receiver.
- (e) The supervisory signal on the calling cord at the distant B position is also actuated when the called subscriber replaces his receiver, if the trunk circuit is jack-ended; if it is plug-ended, this facility is not afforded.
- (f) The withdrawal of the plug from the outgoing multiple at the originating position causes the display of the clearing signal at the distant B position.
- (g) When the calling subscriber replaces his receiver, the A operator at the originating exchange receives a supervisory signal on the answering cord.

The actual provision of these facilities depends on type of switchboard, type of exchange and make up of the circuit involved. In some instances, automatic call and clear without through supervision are given. In the case of methods of working other than Signal, some modifications are involved—the principles, however, are applicable.

In order to consider the system of no-delay working in more detail, the main methods of operating are briefly outlined:—

- (a) *Order Wire Working.*—Particulars of the called subscriber's number are passed forward by the A operator over a circuit (order wire) set aside for passing service details. The incoming B operator gives head set listening on the order wire (except during periods of light traffic) and assigns the trunk circuit on which the connexion is to be set up. At the incoming end, in the case of manual exchanges, connexion with the called subscriber's line is made by means of a cord associated with the trunk circuit used. If the incoming exchange is automatic, the trunk circuits are terminated on a cordless B position and the required number is 'keyed up' by means of a key set; connexion with the called subscriber's line is made via automatic switches.

Order wire working has, in the past, been introduced (apart from cases where direct dialling has been applicable) when a full load can be provided for the B operator at the incoming end and the groups of circuits concerned are sufficiently large to admit of one circuit per group being set aside for an order wire. This method may be regarded as a means for giving a rapid service between two points; it possesses, however, several disadvantages, viz. (i) the

inelasticity in the loading and staffing of order wire B positions, (ii) operating errors result from the use of one circuit for passing service details and another for the completion of a connexion and, also, from the common use of a single order wire by a large number of operators (sometimes in conjunction with other exchanges), (iii) the provision of a separate circuit for passing service details is uneconomical where a small group of circuits is concerned, and (iv) the difficulty of accommodating a large number of order wire keys on A positions.

- (b) *Signal Working*.—The A operator selects a disengaged trunk circuit in the outgoing multiple and gives a signal to the distant B operator as described earlier. Continuous listening is not given by the B operator: connexion between her head set and the trunk circuit is made by the operation of a speaking key on the B position. Particulars of the called subscriber's number are passed over the trunk circuit used for setting up the connexion.

Two methods are adopted for terminating the trunk circuits on B positions: (i) jack ended—the connexion between the trunk circuit and the called subscriber's line is made with a pair of cords (ii) plug ended—the connexion is made with a single cord—a cord and plug being permanently associated with each trunk circuit.

- (c) *Direct Dialling (or Keying)* to distant automatic exchanges.

The A operator selects a disengaged trunk circuit in the outgoing multiple and dials (or 'keys') the called subscriber's number. The trunk circuits terminate at the incoming end on automatic selectors.

- (d) *Straight Forward Working*.—The A operator selects a disengaged trunk circuit in an outgoing multiple, as in the case of signal working, and an audible signal—a number of 'zips'—is passed back to her when the B operator at the distant end is in circuit, i.e., when connexion is made with the B operator's head set as described below. The service details are passed forward over the trunk circuit used for setting up the connexion. At the incoming end, the B operator obtains connexion with the trunk circuits by three methods:—

- (i) *Head set listening*. Connexion is made automatically with the head set of the B operator as she becomes disengaged from the previous call. In the case of an incoming position serving a manual exchange, the trunk circuits are terminated on cords and plugs; when a circuit is picked up by an A operator at the outgoing end, a steady glow is given on a lamp (associated with the circuit) on the B position. This steady glow changes into a flashing signal when connexion is made with the B operator's head set. The B operator is normally disengaged as soon as she inserts the plug associated with a trunk circuit (temporarily connected with her head set) into the outgoing multiple. In order, however, to speed up operating, a *special release key* is provided, whereby the operator can release a connexion from her head set in advance of making the connexion between the trunk circuit and the outgoing multiple jack.

In the case of incoming positions serving automatic exchanges, connexion between the trunk circuit in use and the called subscriber's line is made automatically, after the B operator has 'keyed up' the called subscriber's number. The B operator becomes disengaged as soon as the keying of a number has been completed. A pilot signal on the B position is displayed when a connexion is made with the B operator's head set until the called number has been completed. A pilot signal on the B position the supervisory signal on the A operator's calling cord is displayed until connexion is made with the

B operator's head set; it reappears when the connexion is freed from the B operator's head set and standard supervision is then given.

- (ii) *Jack ended*. The trunk circuits are terminated on jacks on the incoming B position; the operating and signalling arrangements are the same as for Signal Working. The B operator inserts a plug into the trunk circuit on which a calling signal is received, the associated speaking key is operated, and connexion is then made with her head set.
- (iii) *Key ended*. The trunk circuits are terminated on speaking keys and single cords on the incoming B position; the operating and signalling arrangements are the same as for Signal Working. The B operator throws the key associated with the trunk circuit on which a calling signal is received and connexion is then made with her head set.

As soon as a connexion is made with the B operator's head set, in each of the above cases, an audible signal (a number of 'zips') is passed back to the originating A operator. In the case of head set listening, only a fraction of a second should elapse between the A operator plugging and the passing back of the 'zip' signal.

Experience of the straight forward (head set listening) method has been limited in the British system, but results so far obtained have been very satisfactory. In connexion with the partial conversion of the Manchester area to automatic working in June, 1930, straight forward operating was introduced on circuits from certain manual exchanges in the area to keysending B positions serving the automatic exchanges.

With suitable means for assisting in the selection of idle circuits at the outgoing end and for the distribution of traffic to B positions at the incoming end, the straight forward (head set listening) method appears to be definitely superior to order wire working—the disadvantages attaching to the latter being eliminated. Experiments in straight forward working between manual exchanges have been in progress for some little time and it can be safely asserted that, within the next few years, the majority of order wire groups will be converted to the straight forward method with head set listening.

The key ended and jack ended straight forward methods of working are identical with Signal Working except that the normal salutation by the B operator, when answering a signal on a trunk circuit, is replaced by the 'zip' signal. These methods are usually adopted when there is insufficient load for a 'head set listening' position and to permit of team working at incoming positions. The justification for their introduction in place of signal working is that uniformity is produced when they are used in conjunction with 'head set' straight forward working. Further, when the introduction of head set listening in the place of jack or key ended working is warranted, through the growth of traffic on a particular route, no fundamental change in operating procedure is apparent to the outgoing end. The adoption of these secondary methods of straight forward working should, therefore, make for reliability.

The above descriptions relate to direct calls; indirect connexions are set up by the duplication and combination of the methods mentioned. When a duplication of a method is used, the connexion is commonly referred to as a *tandem* operation. In the case of straight forward working, the American practice is for the originating operator to receive *three* 'zips' from the intermediate exchange (as an indication for her to pass the *name* of the distant exchange required) and to receive two 'zips' upon the operator at the distant exchange entering the circuit (as an indication for her to pass the *number* of the called subscriber). Here again, the straight forward method is definitely superior to tandem order wire working.

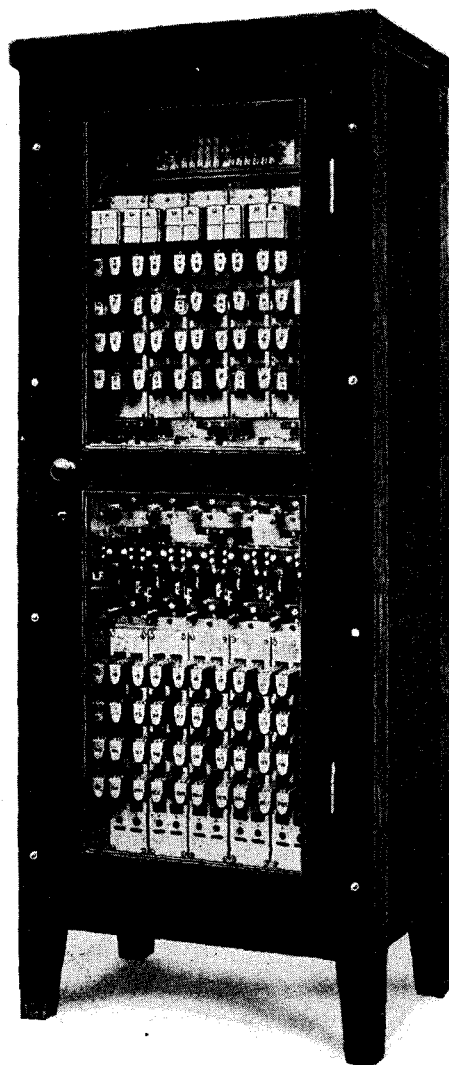
Having indicated the probable replacements of methods (a) and (b) by (d), the direct dialling method remains to be considered. Recent research in connexion with Voice Frequency Impulsing

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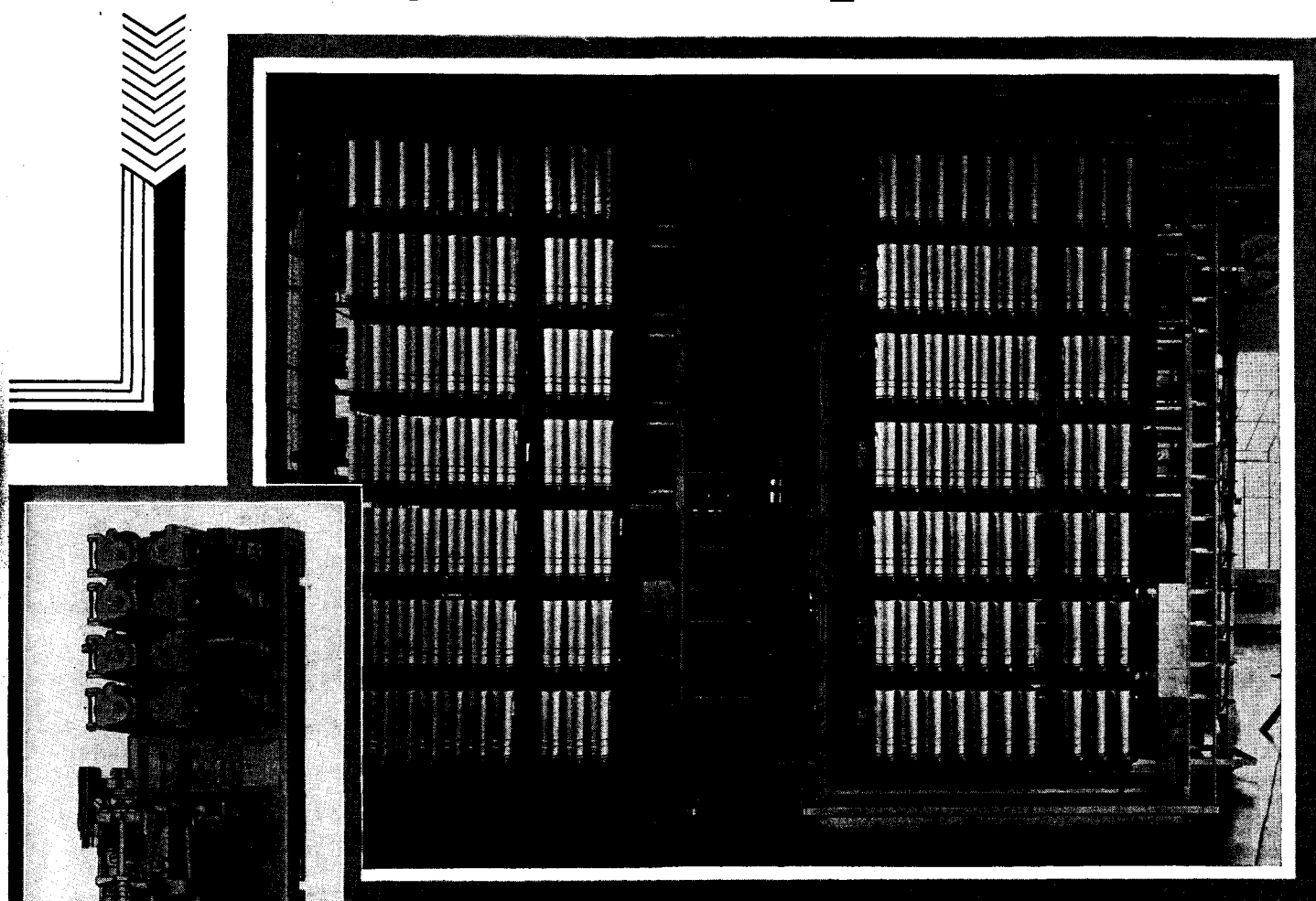
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And the capacity for measurement has kept pace with the advance of science, so that to-day measurements of intricate character—of vast and minute quantities—are everyday occurrences. Michael Faraday, the great scientist, whose centenary will be celebrated next year, stated that no invention could be of any practical value until its quantities had been measured and compared.

The science of Radio has brought in its train the necessity for the calculation and measurement of the various factors involved, and the Radio technician has at his disposal to-day means for measuring and comparing the different factors of any given piece of apparatus.

Take a Receiver, for example. The four principal factors which can readily be determined by measurement are:—

The overall amplification, which determines its range; the selectivity, which governs the separation of stations; the output power, on which depends the volume the set can handle without distortion; and finally, the quality factor. This is not easy to explain to the non-technical, but we will try to make it clear. If a set were capable of responding equally to all audible

frequencies, it would be *perfect*—100%. Since it is physically impossible for any commercially made set to respond equally to all audible sounds owing to the different characteristics of the various components and their inherent losses, comparison is made in respect of quality by ascertaining by measurement how nearly a uniform response—or perfection—is reached. This can be, and is, done.

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makes it possible to set aside the limits in distance which at present apply to direct dialling and there is little doubt that dialling over long and short distances, with the use of key sets on A positions, will be common practice within the next few years. The simplification of operating at the outgoing end will give increased speed and reliability, and the elimination of the B operator at the incoming end will produce considerable economy in working.

The dialling method also lends itself to satisfactory tandem working; in Great Britain, certain places on the Continent and in America, connexions are set up, in some instances, by successive dialling operations either on the part of the subscriber or the controlling operator.

Apart from the question of the modification of operating methods, development of no-delay services will also take place from the extension of areas served by no-delay routes, as the cost of providing cables and associated apparatus decreases. There is, however, a limit which must be placed upon the traffic which can be handled and controlled at the A positions of *manual* exchanges. Problems associated with the circulation of calls, timing, transmission and signalling become serious as more and more trunk traffic is handled in conjunction with the local and local junction calls. One step which can meet this situation—one which has, in fact, been adopted in London—is to segregate the more important no-delay traffic from the local and local junction traffic by the use of separate toll switchboards. In the case of calls originating on manual exchanges, this means an additional switching before a subscriber is connected with the operator who can accept his demand, and, while such a course may be suitable for a centre such as London, there would be difficulty in introducing a system of this nature at small Provincial centres. The problem is, however, solved to a very large extent, in the case of automatic areas, where local and local junction calls are operated automatically by the subscribers; and the no-delay trunk traffic is dealt with at the auto-manual switchboards. These positions are virtually toll boards; in fact, in the case of Director automatic systems, the term 'toll' is introduced, and the code TOL dialled in place of the O used in the non-Director automatic systems. It would seem that, for automatic areas, there is no serious difficulty, from an operating point of view, in transferring more and more inland trunk traffic from a delay to a no-delay basis.

In the same way that the extension of no-delay areas may be contemplated, so conceivably might the local areas served by automatic systems be extended, with a consequent transference of no-delay trunk traffic, handled on a manual basis, to local junction traffic effected automatically. Recent developments which will assist towards this end are (i) multiple registration (additional 'calls' are registered as the distance between the exchanges concerned is increased), (ii) multiple timing (additional 'calls' recorded on long duration connexions), (iii) the Call Announcer System (a system developed by the Bell Laboratories under which calls 'dialled out' by subscribers on automatic exchanges are received by distant manual exchange operators orally—talking film apparatus reproduces the human voice in announcing the called number) and (iv) the Two-FIVE system for producing additional exchange names in Director automatic areas (Two-FIVE implies two letter and five figure exchange numbers, e.g., CEntRAL 1-1234).

One subject in connexion with no delay working which requires some comment is *accurate timing*. As the traffic controlled at A positions increases in importance, the more it becomes necessary to ensure that high standards in connexion with the announcement of durations and timing are maintained. Investigations and experiments are proceeding with a view to equip positions on which trunk traffic is controlled with apparatus to assist in accurate timing, &c. One method is the association of a clock of the Veeder type (clock No. 40) with the cord circuit, the movement being started at the commencement of conversation by the controlling operator throwing a key, and stopped by the operation of the calling subscriber replacing his receiver at the end of conversation. The elapsed time can be read at any moment, and a lamp signal (time

check lamp) is given just prior to the completion of each 3 minute period.

The French Administration have on trial a similar arrangement under which the timing device is controlled by the subscriber's switch-hook. An additional feature is, however, introduced—a lamp, associated with each clock, gives an indication of the unit periods which have elapsed, e.g., a steady glow for the first three minutes, a flash with a long interval for the second period, two flashes with a long interval for the third, and so on, the steady glow starting again at the end of 12 minutes.

Another method evolved by the British Administration, is the provision of a single common *display* (numbers displayed under glass by illumination from small switchboard lamps) on each position. A piece of mechanism, consisting mainly of relays and a line switch, is associated with each pair of cords on which the facility is desired. The movement is started and stopped, and 3 minute periods indicated, as in the case of clock No. 40. The operation of a key association with each cord circuit causes a *display* (just as long as the key is depressed) of the elapsed time (rounded up to the next minute) at any moment during conversation or the total chargeable time if conversation has ceased.

(To be continued.)

PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

By J. J. T.

(Continued from page 44.)

THE main feature of the Federal Radio Commission's autumn session of last year is the unanimity of broadcaster's demands for maximum station power of 50 kw. Eight of them are claiming the two remaining 50 kw. channels available. There have also been complaints at the Commission's limitation of the number of cleared channels available to such stations to 20. At the moment matters seem to have reached an *impasse* and all that one can do is to watch for developments. Meanwhile, the actual American broadcaster is nothing if not original, and not infrequently freakish in order to attain that end. It is told as a serious story that one, a Mr. Harold Turner, ship's wireless chief and official broadcaster over the Canadian National Railway steamship, *Lady Rodney*, loudspeaker system, "is teaching his two parrots some microphone technique." This pair of birds have already proved themselves able to continue certain musical scales when such have been initiated by their own master's vocal chords. The trio, birds and master, have made "dozens of West Indies voyages together," so it is stated. Mr. Turner also claims that his parrot friends can broadcast "The Lord's Prayer in Spanish." Judging from an article which appeared in the *Evening Standard* from their New York correspondent, it would appear that there is already some real desire in the States for something more in the nature and high standard of the British programmes. The complaint against transatlantic broadcasts of the B.B.C. programmes was that they were given at such late hours that Americans were compelled to keep very late hours to hear them. Unfortunately the sender of this flattering news to British eyes and ears, rather shook one's faith in the complete veracity of the communication when, to press home the exactitude, detailed *facts* were given to the effect that, naturally, this would be well understood by intelligent readers &c., &c., for 8 p.m. in London would, of course, be 1 a.m. in New York!

Perhaps the most discussed broadcasting item in this country during the last few weeks has been the "Interference of Stuttgart,"

which actually is not Stuttgart but Muhlacker, which latter is twenty-five miles north-west of Stuttgart, and replaces the first mentioned station. Though replacing Stuttgart, the respective powers of these two stations are vastly different, that of Stuttgart being but $1\frac{1}{2}$ kw., while Muhlacker, the newer station, employs forty times the power of its predecessor, i.e. 60 kw. The minimum separation between stations under the International wavelength agreement is nine kilocycles, and this minimum figure is actually the difference between the London Regional station and Muhlacker. The London *Daily Telegraph* wireless correspondent thus concludes his comments on the present undoubted interference, and while agreeing that the matter is one for international action through the International Broadcasting Union, admits that it raises serious problems for the future. "The number of high-powered stations is continually increasing," continues the writer, "and the time will come when every available wavelength is required for high-power transmitters. Unless some new scientific device saves the situation, this must mean that the nine kilocycle separation plan is useless."

(To be continued.)

CORRESPONDENCE.

"HOW TO DEVELOP THE TELEPHONE SERVICE."

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—In his letter "How to Develop the Telephone Service," published in the October issue, "Contract Officer, Class I" is obviously very seriously concerned with the present state of affairs in telephone circles.

He urges that "it should be the aim of all to endeavour to find the cause (of the present poor showing of Great Britain as regards telephone density to population) and then to seek a remedy." If his use of the word "all" is intended to include the common, or garden telephonist, then I will try my hand. After all, "a little help is worth a lot of pity," and I do sincerely pity the Contract Officers—I should just hate a job like that. However, that in passing.

"Contract Officer" advances many ideas, and furnishes a number of suggestions. They are, of necessity, within his own sphere, and from his own official standpoint, and as I am certainly not qualified to either applaud or deride, I will leave them to more competent critics, and confine myself to his reference "the natural conservatism of the British public."

He, rightly, bids us remember that in spite of our officialdom we too are members of the British public, and, in consequence, unable to deny the soft impeachment—conservatism. Too true. We are all—every man Jack, and woman Jill—conservative to the very marrow; and the biggest rebels amongst us are the worst offenders. Do we not loathe change, however slight? At the first rumour of something "different" do we not throw up our hands in positive horror, and proclaim that the very heavens will fall? Do we not mutter and grumble, and declare that the instigators of the plot are the wrong side of the mad-house wall? We do. What then of the subscribers to our Telephone Service who are, perforce, so much less tutored than we? Conservative? Ye gods!!! Prehistoric.

The average subscriber is a replica of that character in "Angel Pavement" of whom its author, Mr. J. B. Priestley, says "he disliked . . . all the opinions that newspaper editors asked him to dislike." In other words the A.S.'s bad opinion—and he is ninety-nine per cent. bad opinion—is acquired ready-made from the Press. No matter how obliging his exchange, how helpful and assisting the operators, his service is bad; his apparatus vile; the charges outrageous; the whole system inefficient, &c., &c., *ad infinitum*.

The following is a true story illustrative of the more querulous type: A few years ago a certain exchange of the "residential" type, was removed from premises above a shop to the new post office. The subscribers had been duly apprised of the event, and were further reminded of the fact by a whole column in the local "rag." A week or so after the transfer a certain lady complained at great length that her new telephone was infinitely inferior to her old one (true to type) &c., &c., and concluded with this brightest gem: "And what is more, I don't like the way you girls answer me. You are not one quarter so nice or polite as the girls at —" (the late address of the exchange). When informed that she was being served by the self-same operators as of yore, she utterly collapsed with the words, "Oh! I thought I was being answered by the girls behind the counter."

I am sadly afraid that all this is not helping "Contract Officer" to solve his problem. I know I cannot do that, but I am endeavouring to point out to him that it is from this raw, unpromising material he must evolve a telephone-conscious community. I am trying to show him, what he presumably knows already, that the subscriber does not understand the service, he does

not realise "how the wheels go round"; furthermore, he does not want to know these particulars. And we allow him to remain sunk in his lethargy. Consequently there is no enthusiasm; no interest; few orders. The business man has the telephone because he must; his wife has it as a social adjunct; but neither receives any pleasure out of it, because they bring to its use distrust in its efficiency, conviction that the capabilities of those who serve them are non-existent, ignorance of its immense potentialities, and the very worst of all, lack of knowledge that it ranks as one of the seven wonders of the modern world, and total absence of imagination concerning the sheer miracle of even the most humble local call.

I wonder if the old adage, "Out of sight, out of mind," is applicable? A man with a radio set is happy because he can "do things with it." He can play about, tinker, please himself. If he smashes it up it is his own fault; if he achieves "America" it is equally by his own efforts. He can "see" what he is doing. Not so with the telephone—even the automatic. With it he is completely in the dark. He cannot see it work, and has no imagination to peep behind the scenes, therefore he has no interest in it.

We in the service do not "show off" enough—that, of course, is not our fault, but you know how I mean.

I have proved a broken reed; I am sorry, "Contract Officer."

L. M. BENSON, Telephonist.

[We have had to abridge Miss Benson's letter on account of its great length.—
ED., T. & T.J.]

MACHINE TELEGRAPHY.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—In the *Journal* No. 185, for August, 1930, I notice you make comment, under "Telegraphic Memorabilia," on an article which appeared in the May issue of the *South African Postal and Telegraph Herald*, under the title of "The Humour of Machine Telegraphy." As the writer of the article in question I feel flattered that it was even noticed so far afield, and perhaps I deserve your castigation *re* being unfair to makers of telegraph machines.

The article was intended to be of the "light" type, perhaps "very light." The gist is based on actual happenings a little exaggerated, and, I am afraid, was spoilt by the inclusion of the last paragraph, which on reading in print I would gladly have withdrawn.

I realise, as most of us do, that machine telegraphy is fast replacing manual. I realise, too, that many of the machines do handsome work; but I had in mind that there is a tendency on the part of the authorities to introduce immature and not too well tested types of machines, possibly on the grounds that theoretically they should be perfect, but more than likely owing to the glowing advertisement of the particular machine by the makers.

I believe there was considerable comment in this direction in the *British Post Office Workers' Magazine* some time ago, and I believe also that the B.P.O. is likely to scrap all or nearly all types of machines for the teleprinter. I may be wrong in this, but the report of the B.P.O. Commission to America leads me to believe it.

It may be of interest to you to know that the Pretoria—Capetown circuit, over a thousand miles in length, is, weather conditions permitting, worked by teleprinter at 65 w.p.m. Teleprinters are also in use on the Durban—Johannesburg lines. In the near future it is said that all our main lines will be operated on the teleprinter system, including YQ press lines.

I will, however, make my peace with the Editor of the *S.A.P. and T. Herald*, and at the risk of a further castigation from you for this letter sign myself—

"IMPULSIVE."

Pretoria, Oct. 17, 1930.

["Impulsive" need fear no qualms regarding the very mild comments on his article of May, which were made with the sole intent of placing before our readers another facet of the question. Certainly there was no intention of a rebuke. The *S.A.P. and T. Herald* is read every month by the *T. and T. Journal* Staff, and we hope to read other items from the pen of our South African friend.—ED., T. & T. Jnl.]

X FOR XMAS.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—Apropos of a contemporary's tilt at us, commented on in this month's "Hic et Ubique," you overlooked the possibilities of X for Xylophone which avoids the difficulties inseparable from Xenophon and Xylonite. Unfortunately, it fails because X, a little-used consonant, has no distinctive sound to itself when employed as an initial.

"X"mas, of course, avoids this difficulty without the necessity of employing adventitious aids such as an initial "E." It is, however, really the worst of all, for I believe that the X is actually the Greek letter "chi"—Xmas is therefore "Ch"mas, admittedly a difficult word to pronounce to most revellers when the day of the 25th is advanced. I give it up!—I am, Sir, yours faithfully,

Reading, Nov. 17.

F. J. LANE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—It has recently been stressed on Contract Officers that *personality* counts. I agree. I call on the Marquis of So-and-So, Sir Somebody Somebody, Lady So-and-So, &c. They tell me their troubles and I suggest ways and means of meeting their requirements. I leave them happy in the knowledge that the personal representative of the Controller, the London Telephone Service, will set the matter right. When their friends require service, &c., they are advised to ring up Mr. R., the representative of the Controller, who will call and help them. Fully aware of the importance of being the said representative I call.

My importance sinks to zero. I am calling on the gentleman who has seen me knocking from door to door, and thought I was the representative of a firm of patent carpet sweepers. Or I am calling on the gentleman who has read in the daily Press "*this importunate young man*." Maybe he read the November issue of the *Journal* and saw me likened to "*this representative with cap in hand* (and agreement in pocket)."

Possibly I have painted a rather black picture, but I should hate to hear my friends of the "C.T.O." reading the last issue of the *Journal* exclaim "My word! Fancy W. J. R. ceasing to be a Civil Servant and becoming a Servile Servant."

The two cases quoted from the November issue of the *Journal* possibly come under the heading of Salesmanship, but to me they suggest the salesmanship of quack medicines and patent pills rather than the methods of the greatest business organisation in the world—the British Civil Service.

—Yours, &c.,

W. J. REASON.

N.W. Contract Office.

[We would point out that the expression used by our L.T.S. correspondent was not "cap in hand," but "hat in hand." There is a distinct difference between the sense of servility conveyed by approaching a person "cap in hand" and the sense of common politeness conveyed by raising one's hat when one addresses a lady.—ED., *T. & T.J.*]

ADVERTISING AND TELEPHONE DEVELOPMENT.

THE method described here of using unsuccessful interview cards for distributing telephone advertising leaflets and tariff postcards to all prospective subscribers at intervals of three calendar months may be of interest to Contract Staff.

First, it should be explained, the cards are made out only when an interview has been secured with a responsible person and the interview is well worth repeating.

A date is written on the top right-hand corner of the card which shows whether a repeat interview is worth seeking at the end of three months, six months, one year or two years. Before the card is filed in its usual order, it is noted on a "Date" card to ensure its withdrawal from the cabinet for the repeat interview, the procedure being as follows:—

After the Class I Officer has checked and initialled the cards, the Contract Officer places them in no particular order in a separate section of the cabinet, and on the Saturday the cards are divided into groups by the Contract Officer for entry on "Date" cards. First, they are divided into groups in the order of the dates on the top right-hand corner. Next, each group is divided into exchanges. Lastly, the group for each exchange is divided into streets. The cards are then entered on "Date" cards. Next, the "Date" cards are placed in a "Date" Index in the cabinet and the C.M.58 cards are filed in the usual order. After this, the Contract Officer withdraws his "Date" cards for the week following the next Saturday, and also the relative C.M.58 cards for posting advertising literature to the "prospects." When this work is done, the Contract Officer hands the "Date" cards to the Class I Officer, with the literature in envelopes ready for posting.

It may be mentioned, in passing, the Contract Officer then has two weeks' cards in his possession for "repeat" interviews and sorts them into localities to avoid, as far as possible, going over the same ground more than once, which, besides saving his time, tends to economise engineering costs and expedite completion of orders through the concentration of work.

In the manner described, literature goes to the 3-month "prospects" once in 3 months; to the 6-month "prospects" once in 6 months; to 1-year "prospects," once a year; and to 2-year "prospects" once in two years. But, in addition, reference is made to the "Date" cards for the quarterly days, from the

dates in respect of which literature is sent to "prospects" dated for the week following the next Saturday, so that literature is sent to every "prospect" every third month after the last interview. For instance, on Saturday, Jan. 3, 1931, the "Date" cards withdrawn from the cabinet for the week following next Saturday will be for Jan. 11-17 inclusive, for the purpose of withdrawing the unsuccessful interview cards with these dates in the top right-hand corner for posting advertising literature and repeating the interviews. In addition, on Jan. 3, reference will be made to the "Date" cards for April 11-17, July 11-17, Oct. 11-17, 1931; Jan. 11-17, April 11-17, July 11-17 and Oct. 11-17, 1932, for postal distribution of literature.

The sorting of the cards into groups for entry on the "Date" cards saves writing, and facilitates reference to the C.M.58 cards for withdrawal from the cabinet. Ten entries may be made on one "Date" card, each entry being spread over 3 columns. Column 1 for the exchange code or the name of the exchange; Column 2 for the name of the street; Column 3 for the street number; or the name of the house, if there is no street number; or the surname of the "prospect."

J. P. U.

TELEGRAPHIC ADDRESSES.

IT is in the interests of users of the Telegraphic Service to ensure as far as possible that their telegrams shall bear either a full address or a registered abbreviated address, which can be registered at a Fee of £2 a year.

In view of their obvious advantages, we are surprised to hear that the use of "telegraphic addresses" is decreasing. They not only effect a substantial saving in the cost of telegraphing, but also ensure the inclusion of the name of the person registered in a book of reference so well-known and often consulted as the long-established "Directory of Registered Telegraphic Addresses," published at 8, Johnson's Court, E.C.4, and better known perhaps as "Sells' Directory."

THE TELEGRAPH IN PERSIA.

IN a letter published in *The Times* of Dec. 18 last, Sir Percy Sykes pays a fine tribute to the men who built and maintained the lines of the Indo-European telegraph service across Persia. The letter is as follows:—

TO THE EDITOR OF "THE TIMES."

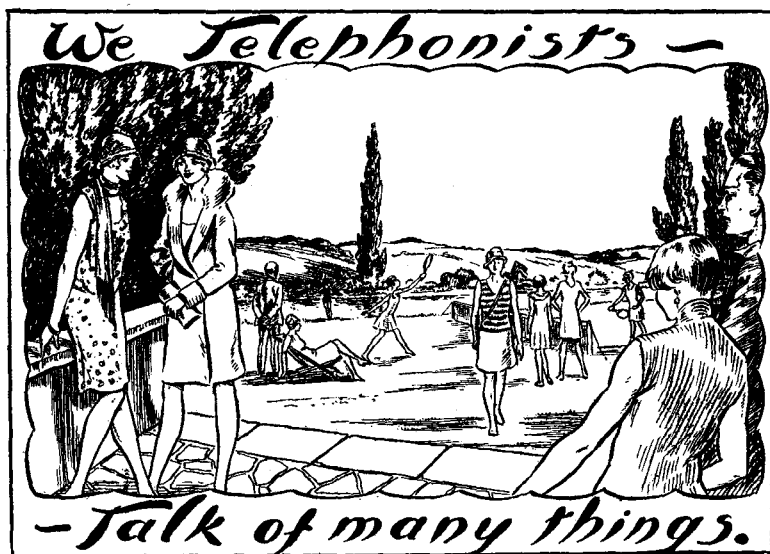
Sir,—I have read with deep regret in *The Times* of the 13th instant that, after an existence of 60 years, the Indo-European Telegraph Department and Company are relinquishing all their telegraphic lines in Persia. I think that few of my fellow-countrymen are aware of the valuable services rendered by their British officials, and perhaps I may be permitted to refer to them.

The construction and maintenance of the great trunk lines across Persia and Baluchistan, which constituted a valuable link between Great Britain and India, called for courage in the face of dangers and difficulties, character, and tact in dealing with all classes of the population. To such a degree were these qualities displayed by our fellow-countrymen that their influence for good was of the greatest benefit to Persia. Accurate information was, time and again, given to the Persian Government which saved many a rising, while the fact that the telegraph offices were *bast* or sanctuary permitted the oppressed to petition the Throne against a tyrannous Governor. Again, it was through these officials, often living alone among the people, that Persians learned something of the order, the rectitude, and the devotion to duty of the British. Indeed, in great part we owe to them the splendid prestige we enjoyed in Persia. During the Great War the services of the telegraph officials were invaluable. They gave me accurate information, they bought and laid out supplies for my troops, while their wives nursed the wounded. Some of the officials joined the fighting line, and the first officer in my force to be killed in action was a member of the Indo-European Telegraph staff.

Looking back after 40 years, I recall to my mind Blackman, who rushed into a dark passage armed only with a small revolver and saved his Persian staff from a mad wolf. I also recall King Wood, who both pioneered for and constructed the first direct land-line across Persia to India. There were many others, who calmed fanatical mobs by their courage, or who headed rescue parties and saved their lineguards, who were overcome by the winter blizzard. To conclude, I may say that no body of men has a finer record, and Persia will be the loser by their departure.

I remain, Sir, yours faithfully, P. M. SYKES.

The Athenæum, Dec. 16.



Somewhat Barbarous.

A HAPPY New Year to everybody. I'm sorry to disappoint you, but here I am again after having been routed by a bevy of fair correspondents—the modern St.'s Georgina out with the beagles after the dragon and uttering their battle-cry "Who will rid me of this turbulent priest: away with that bauble." You might suppose from the way I turn up again and again that I am a bad penny: too bad in fact to get a platform ticket out of an automatic machine or a single ticket to . . . elsewhere—out of a gas-meter. You're wrong about the gas anyway: I've produced columns of it. Lest you have dreamed hopefully that I was the chief sacrificial object of the "Glorious Fifth" or, more charitably, that I had merely succumbed to the gastronomic trials of Christmas, I hasten to reassure you. I escaped the triumphal progress through suburban streets in a chair and I emerged scatheless from the Ordeal by Mistletoe and the Trials by Turkey and the Burning Pudding. I sincerely hope that you have made the best use of the Interlude of Grace bestowed upon you by a merciful Editress and the aforesaid bevy of fair writers, because I am once more sitting on the gate of your private preserve and making faces at you. Having thus brought on the Monday-feeling, I find it rather amusing to wish you a happy New Year. Well, well, cheer up: think of Carnou who has to spend the whole of each happy new year with me. To dispel the gloom, why not pay a visit to the barber? He's an excellent fellow to clear the 'air. Yes, an excellent fellow indeed: never cuts a friend, old or new: always turns the other cheek: waves gracefully in a genial manner and often pours oil on the troubled daughters. Even royalty doffs its crown in his presence. And how patient. He numbers the hairs of the head and remarks "Getting a little thin on top, sir." Picture him, too, after his shop is shut, sorting the spare hairs and tying them into bundles of fifty. And how wise. He can tell a bald man where his face ends and his scalp begins, and how to cause two blades to grow where only one flourishes. The most curious thing about the barber, however, is that he seems to regard each customer as a fugitive from justice with a price upon his head—and what's that! You think I'm lightheaded! More so than usual! Oh! Well, well, possibly, but then I have just paid a New Year visit to the barber. Does that explain matters sufficiently? Thank you.

PERCY FLAGG.

Concerning the Strange Land of El Te-Ess.

1. And between the waters of the river Gov, and the little hills which are known as Ermmment, there lieth the valley which is called El Te-Ess.
2. Now the name El Te-Ess meaneth the land of strange customs, and verily, the way of the tribes that dwell in that land passeth all understanding.
3. Now mighty in the land of El Te-Ess is the tribe of the Subites, for they are many, and the voice of their complaint is a loud voice.
4. And behold! there dwelleth also in the land the tribe of the Servites, and these are they who walk warily on the paths that are in the valley, saying one amongst the other "Lest we slip up."
5. Now the slaves of the Servites are the fair daughters of the tribe of Tel-Ephonists, for the Servites had bought them with gifts.
6. Even as gilt which looketh like gold, so were the gifts of the Servites with which they purchased the daughters of the Tel-Ephonists.
7. And it came to pass that the Servites went unto the tents of the Subites saying "We are thine obedient servants, O mighty Subites. Great is thy wisdom, O excellent Subites; in all things would we obey thee."
8. "Let us, therefore, be thy bondsmen, and if perchance one Subite would go speak with his brother, lo! let us, the Servites, bear the message, lest the journey be too great for him."

9. And the Subites said "Let it be so"; and it was so.
10. Very cunning were the Servites, yea, and smooth were their tongues withal; for the Tel-Ephonists, the slaves of the Servites, were skilled in the art of delivering the words of the mouth to an ear that was even a great way off—yea, even by the movement of the hand could they do this thing.
11. And the Servites cast the burden of the messages of the Subites upon the shoulders of the Tel-Ephonists, but the Servites did promise the damsels shekels of silver for to buy fine raiment, yea and did give it them, for they said—"Lest their hearts wax discontented." Full of guile are the ways of the Servites.
12. And it came to pass that the Subites liked not the help of the Tel-Ephonists, yet could not they say "Let it be so no longer," for they had agreed that it should be so.
13. Then there arose a High Priest from the temples of the Subites, saying "These Tel-Ephonists love not us. They give us the wrong number," which being translated meaneth, "they take the words of our mouths to the ears of our enemies."
14. And he spake these words, saying "They cut us off, they listen in, they pretend to be the Supervisor, they powder their noses, but what these strange words mean, I, Cheri, the scribe know not."
15. Then there arose up another, saying "Yea, and more also, for these the Tel-Ephonists love the moonlight, and oft a Subite, perchance a merchant of great wealth, marrieth the slave of the Servites, in mistake for another, and rueth the day he was born."
16. But it seemeth that he who spake had a grievance, for there is no mistaking the fair daughters of the Tel-Ephonists—by their good looks shall ye know them.
17. There was weeping and gnashing of teeth in the hosts of the Subites.

CHERI THE SCRIBE.

Brixton.

The Staff of the Brixton Telephone Exchange has always taken an active and generous interest in the Queen Mary Hospital for Disabled Soldiers, and seven representatives went down again to Roehampton on Saturday, Dec. 20, to make the customary Christmas gift in person. The gift this year was a donation of £14 which was handed to the matron. This sum will be used for the personal benefit of the soldiers, largely in the form of comforts. Some benefits, however, will take other forms such as the payment of travelling or lodging expenses, to enable a wife to see her husband, which on account of distance she could not otherwise do.

The gift is the third of this amount subscribed by the staff this year, and it is pleasing to know that, although twelve years have passed, time has not dulled the keenness of sympathy for the victims of the war.

A. C. V.

London Telephonists' Society.

The meeting in December last was very well attended; the speakers were both grave and gay, and admirably blended. First Mr. Taylor spoke to us, and soon indignant had us—alas! we could not tell him so, for courtesy forbade us. But Mr. S. (L.G.O.C.) the one who followed after, won all our hearts where'er he spoke, and, harder still, our laughter. The evening was a great success—bad luck to those who spurned it; so let us voice our gratitude; the President has earned it. Next comes the Dance—but not, *bonne chance*, at Bishopsgate the chilly; instead we'll meet, the year to greet, at Lyons, Piccadilly.

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

SHEFFIELD DISTRICT NOTES.

THE annual dinner of the Sheffield Post Office Bowls Club was held at the "Olde Castle Restaurant," when about eighty members and friends witnessed the presentation of the Rose Bowl Trophy to the Telephone Section for the third year in succession. The President, Mr. W. Morgan, Chief Supt. (Postal), presented the trophy, together with a replica, this being the first occasion on which the trophy has been won three years running by the same section.

We offer our sincere congratulations to Mr. R. H. Hunt, Inspector, Engineering Dept., on his success in the examination for Asst. Engineer. Mr. Hunt, who five years ago was a youth-in-training at Sheffield, leaves for London early in the New Year.

Our sympathy is extended to Mr. F. Davidson, Contract Officer, Cl. II, in his prolonged illness. We hope to see him restored to health and back amongst us in a very short time.

The Post Office Engineering Union held a smoking concert at the King's Arms Hotel, Sheffield, on Friday, Dec. 12, with Mr. W. H. Cross in the chair. The excellent musical programme was supplied by members of the Engineering staff, and a thoroughly enjoyable evening was spent.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Oct. 31, 1930, was 1,936,898, representing an increase of 5,671 on the total at the end of the previous month.

The growth for the month of October is summarised below:—

Telephone Stations—	London.	Provinces.
Total at Oct. 31	695,250	1,241,648
Net increase for month	2,453	3,218
Residence Rate Subscribers—		
Total	174,430	271,351
Net increase	1,441	1,605
Call Office Stations (including Kiosks)—		
Total	6,481	26,846
Net increase	71	237
Kiosks—		
Total	2,067	7,218
Net increase	39	172
Rural Party Line Stations—		
Total	—	9,559
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,865
Net increase	—	32

The total number of inland trunk calls dealt with in August, 1930 (the latest statistics available) was 9,856,822, representing an increase of 11,550 over August, 1929.

Outgoing international calls numbered 37,738 and incoming international calls 43,169, as compared with 40,620 and 46,007 respectively in August, 1929.

Further progress was made during the month of November, 1930, with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Silverthorn (Chingford).

PROVINCES—Adderley, Bishopsteignton, Bishop Wilton, Blythburgh, Bow (Devon), Bradley, Crantock, Drybridge, Culloden Moor, Dervock, Earl Soham, Frampton Mansell, Gobowen, Holme Hale, Kevesley, Kirton, Kirkgunzeon, Llanferres, Loppington, Old Rayne, Stoke Ferry, Tredunnock, Upper Largo, Uplawmoor, Walsham-le-Willows, Wootton (all rural automatic); Boscombe, Redcar, Kendal, and Scotstoun,

and among the more important exchanges extended were:—

LONDON—Harrow.

PROVINCES—Bangor, Basingstoke, Blyth, Chesham, Devonport, Eaton, Erdington, Ipswich, Leatherhead, Taunton, Wisbech.

During the month the following additions to the main underground system were completed and brought into use:—

Canterbury—Seabrook, Chester—Whitewich,
Birmingham—Wolverhampton No. 3, Birmingham—Liverpool,
(Section of new London—Birmingham—Liverpool cable).
Reading—Oxford,
Reading—Wokingham,

while 72 new overhead trunk circuits were completed, and 77 additional circuits were provided by means of spare wires in underground cables.

I.P.O.E.E.

FROM time to time lectures of interest to members of the commercial staffs are delivered before the local centre of the Institute of Post Office Electrical Engineers, and on such occasions it is usual to extend an invitation to members of the staffs likely to be interested. Such an occasion arose on Nov. 3, when a lecture on the "Director System" was delivered by Mr. H. G. S. Peck, B.Sc. (Hons.), M.I.E.E. There was a good attendance from the commercial side.

The lecturer approached the subject by first describing a Strowger selector or two-motion switch, indicated the various ways in which selection may be made, and concluded with the trunking chart of the Farm Street Building, which will accommodate four of London's 10,000 line exchanges with directors and other apparatus which will be used in common by them. The limitations of the non-director system, when used in multi-office areas, and the application of the director system to the simultaneous operation of automatic and manual exchanges in an area were fully dealt with. A considerable part of the lecture was devoted to an exposition of the adaptability of the director system to meet the trunking requirements of an area, having regard to the number and holding time of calls, the geographical position of the exchanges, the cable routes connecting them, to the increased traffic efficiency of large groups of circuits and the use of Tandem exchanges. The lecturer was at particular pains to explain, with the aid of the blackboard, the method by which the three digits dialled as the initial letters of the exchange name are translated by the director into any required "code" of from one to three trains of impulses. The lecture was fully illustrated by means of lantern slides.

A well-sustained discussion, or rather series of questions, taken part in by members and visitors, indicated that interest in the lecture had been maintained throughout.

DRAMATIC PERFORMANCE AT MANCHESTER.

THE "Postels" Dramatic Society, consisting of members of the Postal, Telegraph, and Telephone Staffs at Manchester, opened their second season at the Milton Hall, Manchester, on Nov. 25 and 26 last, when they played Ian Hay's "The Happy Ending." The performances were very well received by large audiences, and the Society has every reason to be proud of the support which was accorded it.



Below is a list of characters in the play and a photograph, reproduced by kind permission of The Allied Newspapers, showing how "Laura Meakin" disturbed the Cradock's early morning meal:—

<i>Denis Cradock</i>	Norman F. Baxter.
<i>Harold Bagby</i> ... ..	... Arthur Lowe.
<i>Simmonds</i>	Florence Braddock.
<i>Joan Cradock</i>	Gladys Crosbie.
<i>Sir Anthony Fenwick</i>	Harry Wardle.
<i>Molly Cradock</i>	Nora Tomkies.
<i>Mildred Cradock</i>	Ada Robinson.
<i>Laura Meakin</i>	Nellie Gibson.
<i>Dale Conway</i>	Richard Clement.
<i>Mr. Moon</i>	William P. Jones.
<i>Sir Thomas Mobberley</i> ... ..	... Will Naylor.
<i>Lady Mobberley</i>	Winnie Ogden.
<i>Phyllis Harding</i> ... ..	... Rose Royle.

The "Postels" Dramatic Society, which is only in its second year, has drawn up an ambitious syllabus consisting of socials, play readings, and performances, and bids fair to become a real "live wire" in the social activities of the Manchester Post Office.

F. C. W.

LEEDS DISTRICT NOTES.

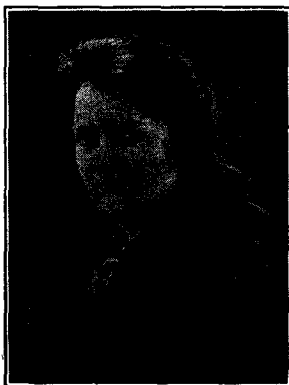
Promotions.—To Mr. J. F. Murray, Traffic Superintendent, we offer our congratulations upon his appointment as District Manager of the West Yorkshire Telephone District, in succession to Mr. T. A. Bates, whose retirement is reported in another column. Mr. Murray has the advantage of nearly three years' experience of the West Yorkshire District, and this will be of great help to him in his new duties. He is assured of our whole-hearted support and co-operation in his efforts to ensure that in these days when a "deep depression" has settled over industrial areas, the West Yorkshire District will maintain a "place in the Sun."

Our heartiest congratulations are also tendered to Mr. T. W. Lawrence, Traffic Superintendent, Class II, upon his promotion to Traffic Superintendent, Class I, vice Mr. J. F. Murray. Our acquaintance with Mr. Lawrence extends over a lengthy period, and the announcement of his promotion was received with great pleasure.

The personnel of our Fees Section has, during the past few months, been heavily depleted in consequence of promotion to the Clerical Class of Misses V. Rich, E. Oldridge, and G. Kershaw, who have taken up appointments with the Ministry of Labour; and Miss E. M. Garnett, appointed to the District Manager's Office, York Telephone District. To each of these officers we extend our congratulations and wish them success in their new spheres of duty.

On the Engineering side, also, our congratulations are offered to Mr. E. W. Deane on his promotion to the post of Higher Clerical Officer in the P.O. Engineering Department at Lincoln. Mr. Deane has come to us from Reading where he was a Clerical Officer in the Engineering Department.

Our Broadcast.—Listeners in the Manchester—Leeds area may be interested to know that the one-act comedy "The Prodigal Husband," broadcast from the Leeds Studio on Dec. 3, was written by Miss Claudia L.



Miss C. L. Wood.

Wood, a Clerical Officer in the Accounts Section of the District Manager's Office, Leeds. This is the second of Miss Wood's plays to be broadcast, the first, "I Tell'd Yer So," was broadcast from the Manchester Studio on May 11, 1929. Both plays are written in Yorkshire dialect.

Leeds Civil Service Golfing Society.—The annual general meeting of the Society was held at the Griffin Hotel, Leeds, on Nov. 27, 1930, when Commr. J. B. Adams, C.B.E., D.S.O. (Ministry of Labour) was elected President for the ensuing year in succession to Lt.-Col. T. P. Hobbins, C.B.E. (Surveyor, East York District).

It was decided to abolish the entrance fee and to fix the annual subscription at 2s. 6d. Affiliation with the Civil Service Golfing Society was also agreed upon.

It was intimated that two competitions would probably be arranged during 1931, one to take place in the Spring and the other in the Autumn. It is also expected that a team representing the Society will engage in a few matches with local clubs, arrangements being in the hands of Mr. H. A. Harrop.

The meeting was followed by a dinner and concert. Mr. J. W. Atkinson (P.O. Superintending Engineer, N.E. District) in an entertaining speech proposed the toast of "The Society," which was briefly responded to by Mr. W. Hawdon, the Secretary. The health of "The retiring President" was proposed by Mr. J. Bownass (Asst. Postmaster) and Lt. Col. Hobbins in his reply expressed satisfaction at the good start the Society had made.

An excellent programme of music and humour was contributed by Messrs. J. P. Kellet, J. P. Behan, Fred. Worth, G. Farndale, R. S. Moon, and J. Galt, and the function was in every way highly enjoyable.

It is expected to hold a smoking concert in the early Spring.

Retirement.—The many friends of Miss E. C. Murray, Shorthand Writer and Typist in the Superintending Engineer's Office, Leeds, will regret to learn of her retirement on pension on Nov. 15 on account of ill-health. Miss Murray entered the service of the late N.T.Co. in March, 1899, being employed in the District Manager's Office, and later the Provincial Superintendent's Office at Leeds. In 1912, on the acquisition of the Telephones by the State, she was transferred to the Post Office Engineering Department.

To mark the esteem in which she was held, a cheque was handed to Miss Murray for the purpose of purchasing a wireless set. The best wishes of the staff are tendered to her, coupled with the hope that with rest, her health will be fully restored.

Retirement of Mr. T. A. Bates, District Manager, West Yorkshire District.—The largest of the banqueting rooms at the Guildford Hotel, Leeds, was filled to overflowing when the staffs of the District Office and the Telephone Exchanges assembled on Nov. 27, 1930, to say their official farewell to Mr. T. A. Bates, District Manager of the West Yorkshire District since 1921.

Mr. J. F. Murray (Traffic Superintendent) presided, and an excellent programme of music and humour by the following members of the staff, Misses Beecham and Kershaw and Messrs. Niemann, Farndale, Galt, and Symons, provided an appropriate setting for the presentation.



Mr. T. A. BATES.

Tributes to the regard and esteem in which Mr. Bates was held formed the keynote of the speeches made by Mr. Lawrence (Traffic), Mr. Cockrem (Accounts), Mr. Beardsall (Contract), Miss Hindle (Bradford Exchange), Miss Morfitt (Leeds Exchange), Miss Jowett (Representative of the U.P.W.), and Mr. Macdonald (Staff Officer). Mr. Tate, who retired in June last, extended a welcome to Mr. Bates to the ranks of the leisured classes.

The presentation, which consisted of a Columbia Radio-Gramophone, was made on behalf of the Staff by Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster-Surveyor) who made reference in a humorous speech to the motoring exploits of Mr. Bates and his Riley car. Mr. Bates, in his reply, entertained the company with some amusing reminiscences and thanked the whole staff for their kindness to him and for the enthusiastic support which he had received from all branches of the telephone staff.

On the following evening Mr. Bates was entertained to dinner, also in the Guildford Hotel, by Lt.-Col. Jayne and his principal officers, the Head Postmasters, and Mr. J. W. Atkinson (Superintending Engineer) and the principal officers on his staff. The numerous speeches made in the course of the evening had all of them in common the very high appreciation of the co-operation and assistance which Mr. Bates had always been ready to give, and universal regret was expressed at the termination of a period of very happy associations.

A graceful compliment to Mr. Bates was paid by Mr. Tatlock (Office of Works), who detached himself for a few minutes from a Staff dinner in another part of the building to look in at the presentation function.

Lt.-Col. Jayne, on behalf of the company, presented Mr. Bates with a muffineer and a hot water jug in silver. Mr. Bates suitably replied, expressing his thanks and the great pleasure he had found in his work with all branches of the service.

The musical side of the evening was in the capable hands of Mr. Sheppard and Mr. Thrippleton of the Survey staff. A tribute is also due to the efforts of the M.C., Mr. Bownass (Assistant Postmaster) who created an atmosphere of jollity which did much to disguise the sadness of farewell.

BIRMINGHAM NOTES.

Birmingham Telephone Society.—The interest in this movement continues unabated. Another large audience assembled on Dec. 3 to hear Mr. E. T. Vallance, Assistant Traffic Superintendent, give a lecture on the Operations and Functions of Automatic Switches. The inferior acoustical properties of the lecture room, which have been a source of anxiety, are now greatly improved by the installation of amplifiers and loudspeakers, loaned by Mr. A. G. Cooper, Assistant Traffic Superintendent. The equipment was first used on the occasion of this meeting, and the result was most satisfactory, everyone present being able to hear quite distinctly.



[By courtesy of Midland Press Agency.]

MEETING OF THE BIRMINGHAM TELEPHONE SOCIETY (FROM TWO ANGLES).

Mr. Vallance's lecture included a detailed description of the action of several types of switch, proceeding on what may perhaps best be described as the "Slow Motion" principle. He made his complicated subject appear very simple, and the form in which it was presented was such that everyone obtained a clear conception of the subject. The lecture was illustrated by lantern slides, some of which were prepared by Mr. Vallance himself. The large number of interesting questions which the lecturer was called upon to answer at the termination of the address showed that the audience had taken a close interest, and were giving the subject of automatic telephones a good deal of consideration.

The concert, arranged by Mr. A. Caine, Contract Officer, Class I, sustained the high standard set by previous concert parties, and was appreciated to the full.

Visit to Manchester.—Five Birmingham Supervising Officers visited Manchester for the purpose of receiving tuition in the Director Automatic System.

A full course of study, which included practical experience on all types of position in the auto-manual exchange, was completed.

Visits were made to the Trunk, City and Central Exchanges.

The officers concerned wish to convey their thanks and appreciation to their colleagues in Manchester for a very valuable and enjoyable experience.

Staff Dance.—A dance, organised by a committee in the District Manager's Office, took place in the Imperial Hotel on Dec. 9.

An excellent party, comprising all ranks of the service, had a most enjoyable time.

Lecture to Engineering Staff.—On Dec. 6, Mr. B. Lynn, of the Engineer-in-Chief's Office, gave a lecture to some 200 members of the Birmingham Engineering Staff on Straightforward Junction Working. Members of the District Manager's staff were also present. Mr. Lynn dealt with the failings of order wire working and went on to describe the principles of the Straightforward Junction system, already working in Manchester, and which will be used at Birmingham. The lecture concluded with a brief account of voice frequency key sending and the possibilities of long-distance keying which this development makes possible.

GLASGOW TELEPHONE NOTES.

The Douglas staff held a dance on Nov. 7 at which about 100 members of the staff and friends attended. Dancing commenced at 8 p.m. and continued until 2 a.m. A very enjoyable evening was spent, the success of which was due to the efforts of the committee. Mr. A. E. Coombs, the District Manager, and Mrs. Coombs were present, also Miss Mortimer, Supervisor, and Miss Tulloch, Asst. Supervisor.

During the interval Mr. Coombs was called upon to make a "little" speech, and this he did in his usual humorous strain. The company responded by singing "For he's a jolly good fellow."

The annual staff dance of the Trunk Exchange was held in the Prince of Wales Halls on Friday, Nov. 21. The popularity of the function was evidenced by the attendance of more than 100 couples, and included all the heads of the telephone department.

The dance programme was varied, and noteworthy inclusions were the military two-step and valeta; and these, together with "Paul Jones," were perhaps most popular. Two novelty dances (for which splendid prizes were awarded) were also included, the fortunate couples being Miss M. Aitken and Mr. J. Purvis in the spot waltz, and Miss M. Brackenridge in the wrong number or affinity fox trot.

Hamilton McKellar and his band discoursed the music and were a very able combination and kept the proceedings lively.

The efforts of an enthusiastic committee were directed towards the enjoyment of everyone, and it was a happy thought that the whole of the surplus should be devoted to charity. The Sick Children's Hospital and the Dental Hospital benefited to the extent of £2 each.

On Friday, Dec. 12, under the auspices of the Post Office War Hospitals Entertainments Committee, a very successful and enjoyable evening was spent at Bellahouston Hospital, when the patients were entertained by the Trunk Staff. This being the final entertainment before the closing down of the Hospital, an extra special effort was put forth to make it a night to live in the memories of all present. Tea was a happy feast of good things, and thoroughly enjoyed by the boys, girls and friends. Whist was the next feature, and, with Mr. Hunter in command, proved a source of great pleasure. The first prize, a casket of cigarettes, was tied for and won by Miss Kay, Supervisor of Trunks, and duly handed over to the bed patient, whom she substituted. The other winner, one of the patients, was presented with a silver cigarette case. The Whist prizes were presented by Mrs. Westbury. Then followed a musical programme, presided over by Col. Westbury. The artists, Miss Shields, Miss Green, Miss Heron and Mr. Lamont, gave of their best and were ably accompanied by Miss Bryson, pianist. The whole proceedings were carried through both by the Hospital and Trunk Staffs with such a happy spirit of friendliness that it was with great reluctance the evening was brought to a close by the singing of Auld Lang Syne.

Those present included Colonel and Mrs. Westbury, Mr. and Mrs. Coombs, Mr. and Mrs. Johnson, Miss Kay and Miss Cameron.



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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of November resulted in a net gain of 4,312 stations.

There are now more than 700,000 stations in the London Telephone area. At the beginning of 1921, rather less than 10 years ago, the total was 334,000.

The microtelephone instrument is becoming increasingly popular and on about 40% of the orders for new extensions these instruments are being ordered; approximately 12,700 have already been provided in the London area.

Here is an example of progress in the Wallington Exchange area in a little more than 5 years.

On Jan. 1, 1925, there were 585 direct exchange lines working on the exchange and this number had increased to 2,347 by Dec. 1, 1930; an increase of rather more than 300%. This is good progress, but the increase was fully anticipated by the development forecast furnished in 1925.

An enquiry has been received regarding the provision of telephone lines for conveying "noises" from the principal London railway stations to the Schoolboys' Exhibition to be held soon at Olympia.

An enterprising insurance canvasser has hit upon a plan of advertising his business by distributing literature in telephone kiosks.

The value of the telephone to the insurance world has evidently conveyed the impression that the people most likely to realise the need for insurance are telephone users.

L.T.S. Sports Association.

Football.—Here is the record of the team in the League competition up to Dec. 13:—

Played.	Won.	Lost.	Drawn.	Points.
8	8	0	0	16

This is excellent progress indeed, and a continuance of such form will assuredly lead to championship honours.

Recent games played have resulted as follows:—

Nov. 15.—Office of Works	...	...	...	won	2-0
" 22.—Air Ministry	...	...	...	"	6-1
" 29.—Agricola	...	...	...	"	3-1
Dec. 6.—Ministry of Labour	...	...	...	"	4-2

In the League Knock-out Competition we have drawn a bye in the first round and meet the winners of the match between Dollis Hill and City Internals in the second round.

Casey, the outside-left, was honoured by selection in the representative match versus the Army at Colchester, which was won by the Service. He has now played in four representative games and requires to play in one more match to qualify for the Civil Service badge.

The London Telephonists' Society.

The third meeting of the current session of the London Telephonists' Society was held in the Lecture Hall of the City of London Y.M.C.A. on Friday, Dec. 5.

The popular appeal of the nature of the subjects announced was exemplified in a record attendance; and the speakers, Mr. W. Buchanan-Taylor, of Messrs. J. Lyons & Co., Ltd., and Mr. Savidge, of the L.G.O.C., Ltd., received a warm welcome.

Mr. Buchanan-Taylor gave a most interesting and informative paper, and dealt with his subject of "Catering" largely from the standpoint of the publicity expert. He instanced one or two historical details indicative of the "romance" of business development. We learned that less than half a century ago the firm of Messrs. Lyons & Co., Ltd., had its origin in the enterprise and acumen of four men whose joint capital, largely borrowed, was only £5,000. To-day it has increased to the enormous sum of eight and a half million pounds.

Messrs. J. Lyons & Co., Ltd., opened their first tea-shop in Liverpool. The original tea-shop opened by the firm in London is in Piccadilly, and it is still serving the public, although its capacity is very small in comparison with the Company's super-shops of to-day which, on occasions when London is well filled with visitors, each serve 35,000 meals in one day. Many details of dietary hygiene observed at the factories in the preparation of food for the public were explained and the lecturer mentioned that his firm spend £250,000 a year in laboratory work, such as the analysis of food ingredients.

Astounding statistics were quoted to show the vastness of Messrs. Lyons' organisation, and doubtless many of our readers help to bring the annual sale of Swiss rolls to the huge annual total of 31,000,000.

Mr. Savidge followed with his talk, entitled "The Story of the London Omnibus." Although the second speaker also quoted statistics to demonstrate the size and expansion of the Company he represented, his treatment of his subject was very humorous, and he so stamped his talk with his personality that one felt the interest of the employer in the employee is almost as intimate in these days of mechanised transport as it was a hundred years ago when the first "horse 'bus" plied for hire.

Mr. Savidge told many amusing anecdotes, and the audience revelled in his drollery. They were especially tickled by the story of the conductor who, when challenged as to how he had avoided, during years of service, a bad conduct mark, and how he had managed to keep a continual good humour in the face of the vituperative remarks of passengers, said: "Ah yes, sir, they call me everything they can think of, and I call them everything back—but, they never hear me."

In conclusion, Mr. Savidge showed a number of lantern slides depicting the omnibus in its various stages, from the top-heavy caravan-like "horse 'bus," a familiar sight in the 19th century, to the luxurious and smooth running omnibus which glides along our highways to-day.

In conclusion, Mr. Pink proposed a vote of thanks to both lecturers and voiced the keen appreciation of the members of the Society. He was seconded by the entire audience, the enthusiastic hand-clapping eloquently testifying to the pleasure which had been felt by all.

The London Telephonists' Society are holding their annual dance at the Coventry Street Corner House on Jan. 16, 1931. Tickets 3s. 6d.

On Friday, Feb. 6, 1931, Mr. W. C. Griffith will be the speaker, and his subject "Long-distance Telephony in America as I saw it." Please reserve both dates.

L.T.S. Armistice Day Anniversary, 1930.

The appeal for the Armistice Day Anniversary was issued as usual, and the total amount subscribed was £79 18s. 11d. After deducting the expenses in respect of the cost of the wreaths, flowers, &c., the sum of £75 11s. 11d. was available for distribution and was distributed among the following charitable funds:—

	£	s.	d.
Adair Wounded Fund	7	7	0
Q.M.A.A.C. Old Comrades' Association ...	7	7	0
Lord Robert's Memorial Workshops ...	7	7	0
Star and Garter Home (Compassionate Fund)	7	7	0
St. Dunstan's	7	7	0
Ex-Service Welfare Society	7	7	0
Queen Alexandra's Hospital for Discharged Soldiers	7	7	0
L.T.S. Distress Fund	24	2	11
	£75	11	11

The money allotted to the L.T.S. Distress Fund is for use in cases of distress arising on either the male or female staff, directly or indirectly due to war conditions.

The wreath for the Cenotaph was placed thereon by the Controller, accompanied by the following representatives of the staff: Miss A. D. Robertson (Accounts Branch) and Mr. G. W. Bennett (Night Telephonist).

A wreath was also placed on the Men's Roll of Honour and flowers in front of the Women's Roll of Honour in the Public Enquiry Office, Controller's Office, Cornwall House, Waterloo Road, S.E.1.

London Telephone Service Girl Probationers' Prizegiving.

A peep into the Conference Room on Thursday afternoon would have revealed a very happy gathering. A number of girl probationers attached to the London Telephone Service were assembled for the annual distribution of prizes to those among them who, during the past year, had shown distinction in their studies at the City Day Continuation School.

The Controller, who again presided at this function, congratulated the girls on the splendid report he had received of their school work and on the manner in which they carry out their official duties. He told them that, although at times they might be inclined to consider their duties trivial, they must remember that their performance of these seemingly small tasks reflected upon the efficient working of the Department.

After the distribution of the prizes by Mr. Napier a few words were spoken by Mr. Law, the Headmaster of the City Day Continuation School, who to the delight of those present was able for the first time to attend at the annual gathering. Mr. Law said how well the London Telephone Service students had worked during the past year and how difficult it had been for him to select the prizewinners. He reminded the girls that they enjoyed a special privilege in being able to continue their studies at the day classes whilst at the same time being in paid employment. He pointed out that their teachers and those officials who were interested in their educational

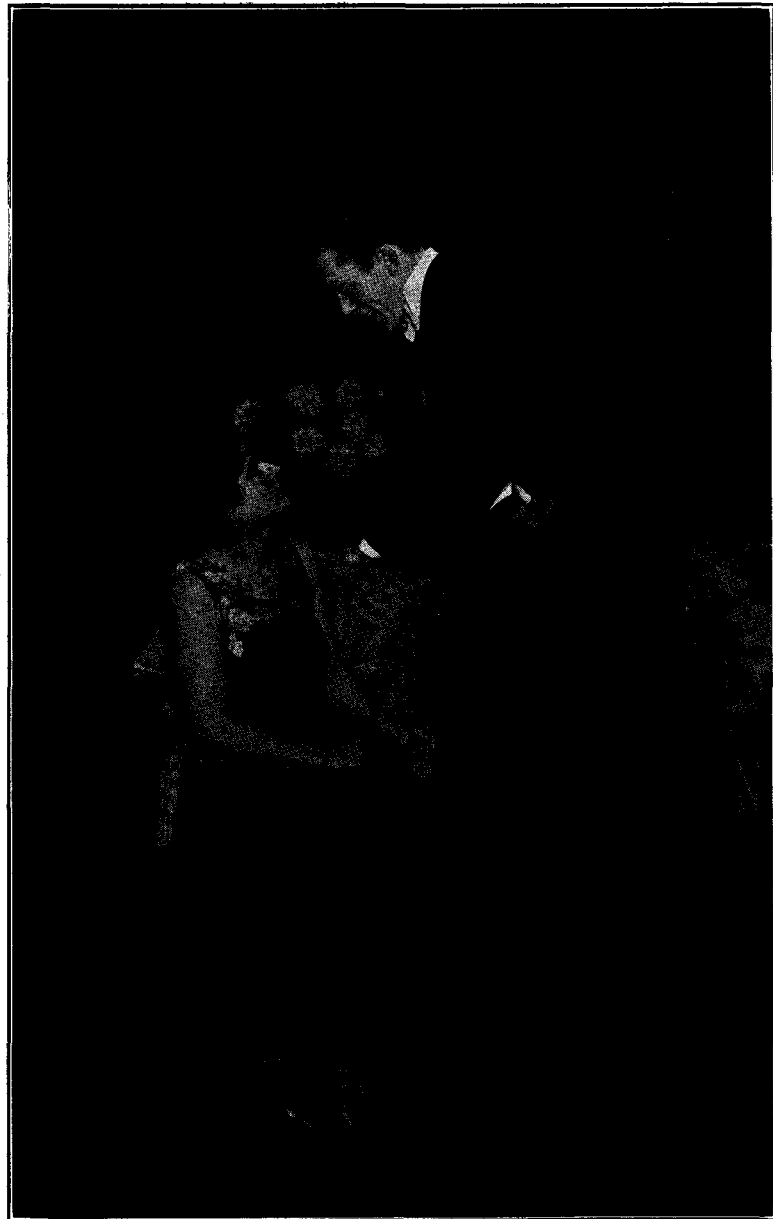
development could only direct their interests and that their ultimate success depended largely on the use they themselves made of their leisure time. He urged them, in conclusion, to make still further effort in the coming year.

Miss Liddiard, on behalf of the girls and staff, thanked the Controller and Mr. Law for their kindness in sparing time from their many activities to be present at this function, and asked the girls to continue to do their best.

Stamford Dramatic Society.

The Stamford Dramatic Society opened their third season at the Cripplegate Institute on Nov. 17 and 18 with John Hastings Turner's "Lilies of the Field."

For successful presentation the play demands a high standard of technique from the members of the caste, and the fact that it was very well received shows that the members of the Society are continuing their progress



[By courtesy of Central Photographic Co.]

"LILIES OF THE FIELD."—I.

Phyllis Lee. Arthur Stevens.

in the acquisition of dramatic skill. The principal as well as the minor parts of the play were all well portrayed. Miss Pond in the character of Mrs. Rooke-Walter, the up-to-date grandmother of Catherine and Elizabeth, the very modern daughters of a country Rector, the Rev. John Head, gave a spirited performance. Mr. Edward Knight, a newcomer to L.T.S. dramatics, acquitted himself right well as the Country Rector, even though for a time his newly-acquired righteousness, coupled with the Rector's indecisive mind,

caused him to pitch his voice in rather too low a key. With this defect remedied, Mr. Knight's acting was a first-rate character study and we shall hope to see him again. Miss Phyllis Lee and Miss Mollie Morgan (Catherine and Elizabeth) were as charming as sweet "twenty-one" should be. Perhaps, however, the audience were not all of the same mind as the Antiquarian, Barnaby Haddon, a difficult part played by Mr. Crossley with the earnestness of the true lover, who, one gathered, preferred Elizabeth as her real "lipstick" self rather than in her pose of the demure Victorian maiden. A candid critic



"LILIES OF THE FIELD."—II.

Nellie Morgan. Edward Knight. Phyllis Lee.

might suggest that Catherine and Elizabeth were not quite so unconventional as the advanced 1930 Miss has the reputation of being, but whether that be so or not, the acting of both was natural and attractive. Miss Morgan as Elizabeth, around whom the theme of the play was woven, put genuine feeling into her dual role.

In these days of short skirts, to be a mother of two such daughters and at the same time a "Mrs. Rector" is not an easy task, and Miss Elsa Wilson should feel satisfied with having held the balance so well between precocity on the one side and the pious innocence of the Rector on the other.



"LILIES OF THE FIELD."—III.

Arthur Strevens.
Elsa Wilson. Phyllis Lee. Frederick Crossley.
Edward Knight. Ula Pond. Priscilla Mitchell.
Mollie Morgan. Ethel White.

In the "Lilies of the Field" the dramatis personæ all have an opportunity of exhibiting their talent, and Mr. Strevens as Bryan Ropes, the aspirant to the hand of Catherine, did his courting so nicely and took such an ingenuous interest in the situations arising during the course of the play, that one liked him instinctively. His comedy was unquestionably good. Miss Ethel Wilkes and Miss Priscilla Mitchell as the Hon. Monica Flane and Lady Susan Rocker,

two society ladies, affecting the manners of the old school, both gave evidence of their talent, and the contempt on the face of the one and the horror on the face of the other when Elizabeth three off her "sham" self were noteworthy.

The Dramatic Society owes a special word of thanks to those players who undertake the rôles of the Maid and the Manservant, on this occasion filled by Miss Bennett as Lucy and by Mr. Harley as Withers.

The Stamford Dramatic Society has justified on its merits the splendid support that it has received. Its members, however, will not take amiss from a friend a suggestion that a greater degree of word perfectness would not only place the Society's performances on a high plane but be a fitting reward for Mr. A. O. Buck, the producer, who has served the society so well and who is to be congratulated on the excellent results he obtains.

Prompt Action by a Supervisor.

The following letter was recently received from the Superintendent of the Line of one of our railway companies:—

"Nov. 5, 1930.

"The Chief Supervisor,

"Dear Madam,—I shall be glad if you will convey my thanks to the Supervisor on duty on Sunday morning last, Nov. 2, for her action in informing my Traffic Controller at Earl's Court that something had blown on to the track between Earl's Court and Gloucester Road. The object referred to was a piece of zinc about 3 ft. square, and the information enabled my staff to remove it promptly and thus avoid a possible interruption of our service.

"Yours faithfully,

Presentation to Mr. W. S. Murrell.

Friday, Nov. 28, was Mr. Murrell's last day in the London Telephone Service, and the opportunity was taken of marking the occasion by presenting him with a suitably engraved gold watch. A large gathering assembled in the Registry, including the Messenger Staff. The Controller, in making the presentation, referred to Mr. Murrell's excellent work as Assistant Head Messenger, both in the L.T.S. for the past three years and prior to that in the A.G.D. Mr. Napier also spoke of the good influence he had exercised over the Messenger Staff and reminded the lads of the loss they must feel at the departure of Mr. Murrell. The Controller, on behalf of the staff, wished him God-speed and hoped that his years of retirement would be happy and that he could never fail to remember the staff of the L.T.S. so long as it was necessary to know the time.

Mr. Murrell, in replying, said that the gift of a gold watch was the best present that his friends in the L.T.S. could have presented to him, for which he wished to express his heartfelt gratitude.

He had enjoyed his association with the L.T.S. for the past 3 years, which completed 36 in His Majesty's Service. Mr. Murrell further added that after this meeting he was proceeding to G.P.O. North to accept from his former colleagues in the A.G.D. a gold chain which would make a fitting accompaniment to the gold watch just received.

Handshakes and farewell greetings closed a brief meeting, but one that will no doubt be long remembered by Mr. Murrell.

It should be mentioned that Mr. Napier was supported at the presentation by Mr. Tinniswood, Mr. Bold and several staff officers.

Personalia.

Resignations on Account of Marriage.

Assistant Supervisor, Class II.

Miss E. Pheby, of Chiswick.

Telephonists.

Miss D. A. Elliott, of Bishopsgate.
" A. Brewer, of City.
" A. R. Wiles, of Clerkenwell.
" E. M. Bekeridge, of Clissold.
" N. Gearing, of East.
" D. K. Clements, of Grosvenor.
" E. M. Fern, of Grosvenor.
" W. E. Toliaday, of Hop.
" E. M. Fish, of Hounslow.
" M. W. Green, of London Wall.
" R. H. Dixon, of Metropolitan.
" F. E. Nash, of Paddington.
" F. E. Wythe, of Paddington.

Miss J. Barnes, of Park.
" E. D. Ingle, of Ravensbourne.
" C. Walsh, of Reliance.
" P. C. Shipley, of Romford.
" E. M. Greenfield, of Royal.
" G. A. White, of Royal.
" S. O'Toole, of Sydenham.
" I. L. Hobbs, of Tandem.
" P. E. Cotter, of Trunk.
" D. L. Acomt, of Victoria.
" D. O. Day, of Victoria.
" I. O. M. Bayliss, of Victoria.

VISITS TO TELEPHONE EXCHANGES BY SCHOOLBOYS AND SCHOOLGIRLS.

In pursuance of a scheme of publicity, which included, amongst other items, arrangements for visits to telephone exchanges by Telephone Advisory Committees, Technical Societies and Telephone Subscribers, facilities have been given in the North Midland district for schools to participate in these visits, and during the past 12 months parties of senior scholars from no less than 52 schools have been shown over exchanges in the district. The Traffic Staff, the Exchange Supervising Staff and the Engineering Staff have co-operated heartily and spontaneously in making these visits a success.

We have been enabled to see letters of thanks and appreciation from headmasters and from education committees, and, what is still more interesting, specimens of the essays written by boys and girls after their visit to the exchange. As we have said, the visitors were senior scholars, and we find most of them displaying a keen interest and very creditable understanding of the technical side of telephony and in the marvels of an automatic exchange. One boy from the Lenton Council School, who models his style on good journalistic precedents, describes how "we looked forward with anticipation towards the coming attraction. At 3.30 p.m. the party were assembled and we boarded a tramcar bound for the Council House Square. Arriving at the Square we alighted," &c., and finally (after a very intelligent description of the visit) "took our departure after a thrilling afternoon."

Another essay—by a girl at Trent Bridge Central School—shows that the young visitors much appreciated their experiences, especially as they watched the operators at work or followed the description by their guide of the automatic processes in action.

The best paper, perhaps, is that appearing in the *Wyggston Girls' Gazette*. We give an extract as indicating the grasp of the subject attained by some of the visitors:—

"We were first taken to the room where the dynamos are which charge the batteries. There are motors, too, which control the bells which ring when a call is made. We saw the little cogwheels which determine the different tones. The one for the ringing tone beats one, two, pause, the sound heard when one makes a call, and the number is disengaged. There are other wheels for the various tones, and we listened to them on another piece of apparatus. They are the ringing tone, the busy tone, that is, when the number is engaged, and the out-of-order tone. There are two pieces of apparatus, so that the work can always be carried on should a breakdown occur.

"The next room we entered was the one where the batteries are kept. These are similar to wireless accumulators. They last about thirty-four hours, and meanwhile another set is being recharged by the dynamos in the adjoining room. Each battery has a small piece of apparatus like a tiny thermometer which records the specific gravity of the liquid. The attendant can easily see if each one is correct. Another wonderful feature is that whenever anything goes wrong in any part of the building a light in each room indicates on which floor the fault has occurred. Someone immediately attends to it.

"Next we were taken to the operating room. Here there were about twenty girls sitting round the room, each at a switchboard and with headphones. These girls attend to all trunk calls, that is, when the subscriber dials 0. Small coloured lights appear on the switchboard, the girl connects up with the caller, asks for the number required and then connects the caller. Each call is recorded by these operators on small slips, which are collected and charged up under the subscriber's name. This work must be very monotonous. There is a special switchboard where all complaints are received. The subscriber dials 91 for complaints.

"We went to see the cable room, which is underground. It is here that the cables enter the building from all over the town. At various intervals the wires are taken up the telegraph poles, and from thence to the houses. The wires, each covered with coloured paper, are contained in lead pipes about three inches in diameter. Each pipe holds about 2,000 wires.

"These wires continue into another room, which we next entered. Our instructors raised the floor boards so that we could see the ends of the cables. Each wire, being a number, had its own place in the wide, tall racks, which contain the tiny fuses. It seemed a confusion of wires, and this part was rather difficult to understand. In another part of the room there were the preselectors. We went to the special place where all numbers beginning with five are. When a subscriber dials five he is connected to this preselector. When he dials the next number this small piece of apparatus falls down two places and thus connects to the next selector. If anyone leaves a receiver off a yellow light appears, and a worker comes up immediately, puts in a plug, and a loud noise warns the subscriber, and he replaces his receiver. If any of the selectors go wrong a red light shows up in every third rack.

"We saw the next selectors in another part of the room. The same thing occurred here with the next two numbers. The final selectors were in a separate room, where there is another apparatus which divides the number of calls between the operators. There are also large boards containing records of the number of calls made by each subscriber."

Of the beneficial effect of such visits to the coming generation of subscribers there can be no doubt.

They are not only familiarised with the idea of telephony, but become acquainted with its How and Why. Any public service is the more appreciated the more it is understood. A person who understands the wonders and intricacies of telephone service will be more just and generous to its problems than one who sees in the telephone merely an instrument to talk into or listen at whilst other invisible persons, whose job it is to do so, furnish him with instantaneous and impeccable connexion as a matter of course.

MANCHESTER NOTES.

Social Evenings.—The Social Evening Committee provided the District Manager's Office Staff at Telephone House with the second Dance of the season on Nov. 22 at which about 200 attended. Among those present were Mr. Whitelaw, District Manager, Mr. Crombie, Traffic Superintendent, and Mrs. Crombie, Mr. Godfrey, Staff Officer, and Mrs. Godfrey. A very enjoyable and jolly evening was spent and the thanks of the Staff go to those hardworking people the Committee for the excellent arrangements made.

The next Social will be held on Dec. 18 of which more anon.

We hear rumours of other activities in the social world which will take the form of another Pantomime by the ladies of the District Manager's staff. Whilst "all is quiet" so far as details are concerned, we are certain that with their customary thoroughness the "show" will be both thoroughly sparkling and up to date.

Transfer.—We extend a very hearty welcome to Mr. J. H. Wilson, Higher Clerical Officer, on his transfer to Manchester from Sheffield District Manager's Office, vice Mr. S. J. Hamilton, deceased. Mr. Wilson is an old National Telephone man with many years' service, and we hope his sojourn in Cottonopolis will be as happy and comfortable as his stay in the Cutlery town.

Presentation to Mr. A. Kemp.—Mr. A. Kemp, Assistant Traffic Superintendent, who has been seconded to the North Midland District as Assistant Surveyor, Class II, left us at the end of November last, after a stay of two and a half years.

On behalf of the Traffic Staff, Mr. Whitelaw, District Manager, paid tribute to Mr. Kemp's good qualities and presented him with a Columbia gramophone. Mr. Crombie and Mr. Green also spoke.

On the preceding day, Mr. Kemp bade farewell to the Exchange staff and was presented with a gold watch chain, cigarette case, and dressing gown by the Central Exchange staff, and a travelling rug from Toll Exchange staff. The proceedings terminated with a resounding cheer.

Promotion.—Congratulations are also extended to Mr. W. P. Richards, who has been appointed Traffic Superintendent Class I, Colchester District, and will take up his new position early in the New Year.

Resignation.—Miss E. Ogden, Writing Assistant, resigned on account of marriage on Dec. 6, and was presented with numerous presents from her colleagues in the District Manager's Office.

Obituary.—The death of Mr. Norman V. Manning, Contract Officer, Class II (retired), occurred on Oct. 28, aged 54.

"Norman," as he was affectionately called by his colleagues, had been "in harness" for 20 years with the National Telephone Co. and the Post Office Telephones in Manchester. His ever smiling face and happy demeanour endeared him to all with whom he came in contact.

Eight of his colleagues from the Contract Department attended the last sad ceremony at the Willow Grove Cemetery, Stockport, on Nov. 1. Mr. Manning had made many friends during his lifetime, and the numerous floral emblems, including four from the District Manager's Staff, were a marked tribute to the esteem in which he was held. R.I.P.

The Manchester Telegraph Messengers' Institute held their Annual Gala at the Moss Side Baths on Friday, Oct. 24, before a good attendance. The programme included an Inter-Office Squadron Race open to Boy Messengers, and a Departmental Squadron Race open to the Civil Service. In the former race Manchester beat Oldham somewhat easily with Sheffield third. In the Civil Service Squadron Race, Sheffield narrowly defeated Oldham after a splendid struggle, Manchester being placed third and Blackpool last.

The 50 yards handicap, open to the Civil Service, was won by F. Wolstenholme of Manchester.

In the absence of Mr. Maddan the prizes were presented by the Assistant Postmaster, Mr. C. A. Moorhouse. Mr. J. T. Whitelaw, District Manager, Mr. W. I. Oldcorn, Chief Superintendent, Telegraphs, Mr. J. B. Jones, Postmaster, of Oldham, and many other officials were present.

LIVERPOOL NOTES.

Visitors to Liverpool.—Liverpool welcomed a visit from Mr. J. T. Whitelaw, Mr. Crombie and Mr. Stafford from Manchester, to discuss for mutual benefit and the good of the service phonogram and telephone-telegram arrangements. Useful pointers were mutually exchanged between them and the Liverpool officers from which general improvements in the services considered should accrue in both districts.

Other visitors in search of knowledge were Mr. Dive and Mr. Jacob, of L.T.S., on information bent in connexion with staffing and establishments, and Mr. Otojro Maruyama, from Kyoto, who is interested in automatic and manual telephone traffic arrangements. Mr. Robson of the Secretary's Office, also paid us a visit in connexion with certain aspects of office administration.

A number of satisfactory meetings of the traffic and operating staffs have been held up to date, and much useful interchange of views has taken place.



[By courtesy of Morath's Pictorial Press Agency, Liverpool.]

MISS DOROTHY GREENWOOD, of the Liverpool Traffic Department, in a dramatic moment in Eric Hudson's Comedy, "The Unfair Sex," which the Liverpool Thalia Amateur Actors recently presented.

The month of December sees further changes in the clerical staff, Mr. Hough (Service Inspector) having been transferred from the Traffic Department to the District Office in order to improve his general experience. Mr. McBride, from the District Office, comes to the Traffic Department, of which he has not yet had experience. He takes over the duty of service complaints and kindred matters. Mr. H. L. Tomlinson has taken over the service inspection work.

Mr. Seed, an Assistant Traffic Superintendent in training at Liverpool, has now been appointed to a vacancy at Newcastle-on-Tyne. We wish him every success in his future career.

Congratulations to Mr. A. W. G. Hewitt on his promotion to a Higher Clerical post at Reading. Mr. Hewitt is deservedly popular with his colleagues and his promotion has given pleasure to his many friends. There will be more to say about this later.

On Dec. 11 the Mossley Hill exchange was transferred to an enlarged equipment. The change has resulted in improved conditions generally for the staff employed.

Thanks to the B.B.C. an echo of the recent broadcast of the work of a telephone exchange was the application of a young girl for employment in the Post Office. Hearing the actual operation of calls so fired her imagination that she then and there resolved to become a telephone operator if she could by any means accomplish that purpose. Let us hope she will be successful.

Interesting evenings were passed when Mr. Gauntlett gave his lecture on "Some Aspects of Supervision" to a number of exchange supervising officers. The lecture has been repeated twice this session and has not failed on either occasion to arouse vigorous and useful discussion.

Relations with the Public and with other Branches. (Thumb-nail lecture given by Mr. W. E. Gauntlett at meetings with telephonists.)—An operator should have an outlook beyond her immediate position.

Bear in mind how her actions impinge on and affect others.

To the public give a good service. This reduces complaints and saves other members of the staff time in dealing with the same.

The operator in her relation to the public, or subscriber, represents the Post Office, and we are judged to a large extent thereby. She should acquire the habit of toleration and make allowance for the subscriber's lack of knowledge of the conditions of exchange work and not forget that the subscriber does not know what is going on at the exchange end.

Civility, carefulness, tact and discretion should be displayed in handling subscribers' calls on all occasions, and the object of the operator should be to give the subscriber confidences.

Team work is a means of assisting your fellows at the board and is very desirable in assisting to reduce pressure and in maintaining a smooth and even service.

You can help other branches by making your tickets clear, exercising care in making the correct charges, both as to time and index letter. Very considerable time is spent and correspondence involved in the Accounts Branch by errors in tickets.

Similarly, by giving a good service you avoid complaints and thus reduce the work of and assist the Traffic Section officers.

Your observation of engaged numbers will help in getting subscribers to take additional facilities if you pass the information on.

WESTERN DISTRICT NOTES.

THE many friends and colleagues of Miss Westlake, Chief Supervisor, Plymouth Exchange, will hear with pleasure that she is now on the high road to recovery, after having undergone a serious operation, and it is hoped that she will be able to resume her duties at the Plymouth Exchange early in the New Year.

What's in a Name?—There are many pitfalls in the path of a stranger to a new locality, not the least being those in connexion with place names and the names of people. Charles Dickens, for example, found the West Country fruitful in furnishing him with many of the quaint names of his characters.

This is the story of a new telephone official finding himself for the first time in Colyton, in Devonshire, bent on obtaining new business. His eye caught an obviously new building bearing the name "Feoffee's Hall." He thereupon went inside and asked if he might see Mr. Feoffee. The caretaker of the hall gave the information that there was quite a number of Feoffees and enquired which one was wanted. The keen P.O. man said the senior one would do, whereupon the caretaker said that, in that case the Chairman had better be written to. This seemed to the P.O. man to be a strange family having a chairman, but assumed that they had turned themselves into a company. Anyhow, an enquiry at the local post office seemed advisable and it was there discovered that Feoffee was not the surname of a family but the Feoffee's were the local council. A reference to a well-thumbed dictionary showed that Feoffee means "a person who is invested with land in fee," which left the P.O. man not much the wiser.

A colleague to whom this adventure was related said that he had not previously heard of the Feoffee's of Colyton, but he had heard of the "Pot-walloppers" of Northam, Nr. Bideford. He said that a pot-wallopper was a native of Northam who boiled his own pot on his own hearth in the parish of Northam and in consequence had the right to play over the famous "Westward Ho!" golf course free of charge.

The said colleague drives a long ball at golf, and whether this account of the pot-walloppers is an attempt to draw a long bow or an equally long leg is a matter of doubt to the writer.

However, it is just possible that the name and its alleged connexion might provide our whimsical friend "Percy Flage" with a text for his fancy, that is if his eye ever reaches these notes.

Staff Meetings.—The staff meetings which have recently been inaugurated by the secretary as an experimental measure are proving a great success in the Western District.

The wild nature of the district renders it very difficult to arrange for as large a number of the members of the staff to attend who would wish to do so, and 8 centres have been formed. Much useful work has been done and it is very gratifying to note the enthusiasm shown by the staff at these meetings.

Very amusing little incidents come to light which operators experience in the course of their duties; e.g., at a meeting at Truro, in Cornwall, a telephonist related an experience with a caller at a multi-coin box.

One market day a farmer, endeavouring to make a call from a kiosk, was told by the operator to press "B" button. After a pause, which necessitated some patience on the part of the operator, and after hearing a great deal of fumbling going on, the caller said, "I have looked over all my buttons, miss, but I be hanged if I can find a 'B' button."

It is the practice of Travelling Supervisors to keep in touch with small exchanges which have been recently opened, to note progress of the operator, &c.

In a case recently, when the Travelling Supervisor enquired, after about a week of the date of opening of an exchange, whether everything was going alright, the reply she received was "I can do it alright, but the lines have been 'haddled'."

Difficulty is frequently experienced in getting replies from private houses in the country. In many cases the local operator knows the habits of the people in the house, and could often say where they are or what they are likely to be doing at a specific time.

Recently, on "No reply" being given on a short trunk line for a call to a private house the calling subscriber requested the operator to ring the number again. Again "No reply" was given, when the distant operator, knowing the call to be an urgent one, said, "Is the girl in the house?" The reply was, "Yes, but she's not exactly a girl, she's a widow."

F. J. F.

LONDON ENGINEERING DISTRICT NOTES.

Retirement of Mr. Wilson.—Mr. R. Wilson, Assistant Superintending Engineer, retired from the Post Office on Nov. 20 and was quietly presented with a wireless set as a token of esteem on the part of those who had worked with him and appreciated his sterling qualities.

Mr. Wilson was very quiet in manner, but of a very kindly disposition, and those who were in close contact with him held him in very high regard on account of his sincerity. His retirement was clouded by the fact that his wife was dangerously ill, and indeed a few days after his retirement she passed away. Less than three months previously Mr. and Mrs. Wilson were visiting some south-west township with a view to selecting a house, and it then looked as if they would spend many happy years of retirement together. However, fate ruled otherwise, and Mr. Wilson is left alone. His only son is in Malay. Nevertheless, it is hoped that time will bring compensation and although life can never be what it might have been, it is hoped that there are still good things in store.

Promotions.—Mr. T. H. Edgerton has been promoted to fill the vacancy caused by the retirement of Mr. Wilson and Mr. Peck has been promoted to Executive Engineer in charge of the Centre Internal Section in succession to Mr. Edgerton. Mr. Peck is welcomed back into the fold after his period of service in the Engineer-in-Chief's Office. Mr. Peck will not find his job an easy one, but will be none the less happy on that account.

Gladstone Automatic Exchange.—An interesting transfer, involving the opening of Gladstone Exchange as a junction centre only, took place on Saturday, Nov. 29.

Hendon Exchange (with Colindale hypothetical) was originally working as a satellite on Maida Vale Exchange, and the transfer in question was to establish the satellite exchanges on a new parent, Gladstone.

The whole of the operations, which were carried out in a space of two to three minutes by means of the withdrawal of wedges from change-over strips without interruption to the service of the satellite subscribers, involved the changing over to Gladstone of the following junction groups: All junctions incoming from manual exchanges to the keysender "B" positions; group of junctions outgoing from the discriminating repeaters at Hendon to the parent; selector lines outgoing from the parent manual board to Hendon first selectors; miscellaneous manual board circuits and service lines. Additional circuits were not necessary in the majority of cases as the circuits concerned passed through Gladstone Exchange from Maida Vale to Hendon and it was possible to cut them into Gladstone. It was also necessary to establish a nucleus of outgoing junctions from Gladstone Exchange to various exchanges, including Tandem Exchange to cater for the outgoing traffic from the satellite exchanges to the London network.

Gladstone exchange will be opened for subscribers service on Jan. 17, 1931, and the outgoing junction groups already provided are being increased and a separate group to Tandem Exchange for Gladstone subscribers is also being joined up.

Automatic Exchange Progress.—In the area comprised in a circle of 10 miles radius with its centre at Oxford Circus there are 118 exchanges with 372,000 lines connected thereto. Of this number 30 exchanges and 95,000 lines are now automatic.

Burst Water Main.—The bursting of a 24-in. water main at St. Giles Circus, Oxford Street, one of the busiest crossings in London, at 8.30 a.m. on Dec. 15 caused considerable damage to the Department's Underground plant and that of other undertakings, besides disorganising road and railway traffic in the vicinity.

Five junction cables, 2 trunk cables and 2 cables carrying subscribers' circuits were badly affected. Approximately 3,000 circuits being put out of order. Steps were immediately taken to divert as many of the faulty circuits as possible to other routes and by the following day a 50% service had been restored on all the affected routes. At the time of writing, the arrangements for the permanent restoration of the plant are well in hand. The scenes in St. Giles Circus were reminiscent, fortunately on a much smaller scale, of those which occurred 2 years ago when a gas explosion in the Old Parcels Tube wrecked the streets in the same neighbourhood.

Engineering Department Films.—An instructive and interesting evening was spent in the Imperial Institute Cinema on Tuesday evening, Oct. 23, when departmental films depicting new methods of underground and overhead construction were shown. Mr. W. F. Boryer, Sectional Engineer of the West External Section, presided and the films were explained by Mr. W. H. Albry, of the Engineer-in-Chief's Office. Jointing methods were first exhibited on the screen, and an animated discussion followed in regard to the conditions under which the operations were carried out. Overhead works were then shown, and these also were the subject of much profitable discussion. After the films were exhibited a discussion took place on the type and quality of the tools supplied and a number of interesting contributions were forthcoming.

The attendance numbered approximately 200, and was drawn mainly from the staff of the West External Section, but a number of men from the West Internal Section were present in response to invitation. At the close of the meeting a hearty vote of thanks was accorded to Mr. Albry for the able manner in which he explained the various points in connexion with the film display, and an expression was also accorded to authorities of the Imperial Institute for the very satisfactory arrangements which were made for the meeting. It was felt generally that the evening was a most profitable one.

Swimming.—The Swimming Club has had a remarkable season as is indicated by the following list of successes:—

Team Events.

Ellison-McCartney Cup.	Premier Division Team League Championship.
Clark Cup.	Team Championship of the Civil Service.
Gresham Shield.	Post Office Team Championship.
Taxes Cup.	Aggregate Points Competition.
Civil Service Team League, Division 3—Runners up.	
Civil Service Water Polo League	—Runners up.

Individual.

Edward Troup Cup.—C.S. $\frac{1}{4}$ -mile Championship. Winner—H. F. Crow.

In the $\frac{1}{4}$ -mile championship members of the club took no less than seven of the first 12 places.

In six other championships the club took 2nd or 3rd place, and in some of them took three of the first four places.

Nine members were awarded badges for representing the Civil Service versus the Forces at swimming and polo.

Mr. A. W. Kelly, Denman Street, will be pleased to enrol new members for the coming season.

Chess Club.—The London Engineering District Chess Club (Denman) opened its 11th Session in October by presenting the prizes won in the previous session.

Mr. Cornish, in the unavoidable absence of Mr. Gomersall, the President of the Club, made the presentations and said he was pleased to learn from the Secretary's Annual Report of the activities of the club that the club was maintaining its position amongst the numerous other social clubs in the district. He was pleased to give any encouragement he could to all such activities and considered chess to be both a recreation and a valuable mental training. He understood that the Denman Chess Club was the oldest social club in the district and that the majority of its members had retained their membership since the inception of the club ten years ago. This was encouraging to all concerned and he wished the club every success in the forthcoming session.

Prizes were then presented to the prizewinners in the various sections of the club's Programme of Events, viz., the Club Knock-out Tournament (special prize awarded by the president); Junior Tournament; Novices' Tournament; and Best Individual Records in the 23 C.S. League matches played in the 1929-30 session.

The annual meeting followed the presentation, and the evening concluded with a Lightning Tournament open to all-comers.

Those wishing to join the Chess Club will be heartily welcomed. Ample opportunities are given for learning the game or for improvement if it is known already. The club meets every Thursday evening in the dining room at Denman Street, and applications for membership can be made at any time to the Hon. Secretary, Mr. A. J. Nevill, Superintending Engineer's Office, Denman Street, S.E.1.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(Continued from page 64.)

- 1908, Jan. 1 ... "Holt" Parliamentary Committee's revision of pay, &c., took place in the Post Office.
Intercommunication switch in Central Telegraph Office—designed by T. F. Purves—completed.
- 1908, Feb. ... Baudot multiplex telegraph apparatus inaugurated on London-Swiss lines.
Arthur Crotch published "The Hughes and Baudot Telegraphs."
- 1908, April ... London-Marseilles telegraph lines equipped with Baudot.
- 1908, May ... Court of Appeal reversed the judgment given in favour of the Post Office relative to royalties on certain private telephone lines.
- 1908, June 1 ... Cash on Delivery system introduced between United Kingdom and Malta, Cyprus and Egypt.
- 1908, June 22 ... M. Poincaré announced to Académie des Sciences discovery by Becquerel of a positive electron in a Crookes' tube.
Post Office abandoned air core loading coils in favour of iron core coils.
Penny post from Great Britain to U.S.A. established.
Post Office opened a wireless coast station at Bolt Head and licensed stations at Cullercoats, Heysham Harbour, Parkeston Quay, and Clifden (for transatlantic telegraphy).
First International Conference of Telegraph and Telephone Engineers held at Budapest. Congress again confirmed system of electrical units.
International Telegraph Conference in Lisbon. Over 70 States and countries represented. Radiotelegraphy and international telephony added to the subjects for discussion.
Telegraph Act gave Postmaster-General certain wayleave rights over land and hedges near public roads.
Murray patented automatic five-unit telegraph transmitter.
Eglin, of France, patented a method of bringing the typewheel of a telegraph receiver into the desired position.
Acknowledgments for deposits of less than £5 in Post Office Savings Bank discontinued. Transfers of deposits allowed between Post Office Savings Bank and Foreign and Colonial Government Savings Banks. Number of depositors 11,018,250; deposits £160,648,214.
Mails for Shanghai via Siberia sent via Dalny as well as via Vladivostok.
Maximum limit of weight on parcels exchanged with United States, in both directions, raised from 4 lb. 6 oz. to 11 lb.
Money Orders payable through recognised Edinburgh and Dublin banks.
- 1908, Nov. 10 ... At the Royal Colonial Institute Mr. Henniker Heaton advocated "Penny a word telegrams throughout the Empire."
- 1908, Dec. 11 ... Telegraph Committee of House of Commons convened a meeting at the Mansion House, London, to discuss the question of State-owned and controlled cables. The Duke of Argyll, supported by Viscount Milner, moved a resolution supporting a policy of low-priced communication within the Empire. Sir Albert Spicer, seconded by the Earl of Jersey, proposed that the British Government should call a conference of postal authorities from all parts of the Empire for the purpose of concerting measures tending to a wider recognition of the policy of State-owned and controlled cables, subject to respect for private rights. Both motions were carried.
- 1909, Jan. 1 ... Service of Insured Boxes commenced with France and Belgium.
Rates of postage on parcels to United States increased. Tariff ranged from 18d. for 3 lb. to 4s. 6d. for 11 lb. by the official service, and from 2s. 6d. for 3 lb. to 5s. 6d. for 11 lb. by the semi-official service.
British Old Age Pensions payable at Post Offices on presentation of Orders, resembling Postal Orders, and issued in book form. Forms of application for pension supplied at Post Offices.
- 1909, Jan. 16 ... Sir E. H. Shackleton reached South magnetic pole in E. long. 155° 161', S. lat. 72° 25'.
Marconi awarded Nobel Prize for Physics.
- 1909, April 2 ... House of Lords confirmed the judgment given in 1907 that royalties on certain private telephone lines could be claimed by the Post Office.
- 1909, Aug. ... Baudot multiplex telegraph inaugurated on London-Dutch lines.
- 1909, Oct. 25 ... Act creating an Assistant Postmaster-General received assent.
Vibroplex—an American morse key in which dots are sent by the vibrations of a weighted spring—introduced.
Wheatstone and Murray automatic telegraph apparatus, simplex and duplex, tried on Anglo-German circuits.
Railway and Canal Commissioners became, by Act of Parliament, arbitrators in telephone and telegraph disputes.
Post Office acquired from Marconi Companies and Lloyds, for communication with ships, the wireless stations at Caister, Crookhaven, Lizard, Malin Head, Niton, North Foreland, Rosslare and Seaforth.
Japanese packet service from Dalny took Shanghai mails and Vladivostok route given up.
Magazine Post between United Kingdom and Newfoundland introduced.
Telegraph Money Order service started with the Azores, Canada, Crete, Madeira, Portugal, and the United States.
Cost of Telephone Service shown separately from that of Telegraph Service in Post Office Estimates. Receipts shown separately in Revenue Accounts.
- 1909, Dec. ... Number of Post Office contracts existing for immediate annuities, 29,015; deferred annuities, 2,708; and insurances, 12,936.
Post Office Savings Bank made 38,000 purchases and 21,000 sales, on behalf of depositors.
Net profit on Post Office Savings Bank since its commencement, £904,312.
Number of Inland Telegraph Money Orders issued, 554,000; value, £1,895,000.
118,000,000 Postal Orders issued, value £45,000,000.
10,512,000 Money Orders issued with value of £39,500,000.
3,584,000 Postal Orders issued in British Colonies and dependencies, value £2,089,000.
Number of foreign Telegraph Money Orders issued, 24,000; value, £216,000.
Number of letters passing through the Post Office—2,906,100,000.
866,000,000 postcards passed through the Post Office.
Telephone receipts, £1,750,308.
Alexanderson, U.S.A., built a two kilowatt alternator for 100,000 cycles per second, running at 20,000 revolutions per minute. (Alexanderson alternators have been produced since then for 200 kilowatts at 22,000 cycles per second, with a speed of 2,170 revolutions per minute.)
R. Goldschmidt, of Berlin, built an alternator based on the production of an alternating current in the stator of a single-phase alternator by the armature reaction of the rotor. Marius Latour also designed a high frequency alternator.
Joly, Plohl, Taylor and Vallauri devised frequency charging transformers for wireless working.
- 1910, Jan. 3 ... First Assistant Postmaster-General (Sir Henry Norman) appointed.

(To be continued.)

THE Telegraph and Telephone Journal.

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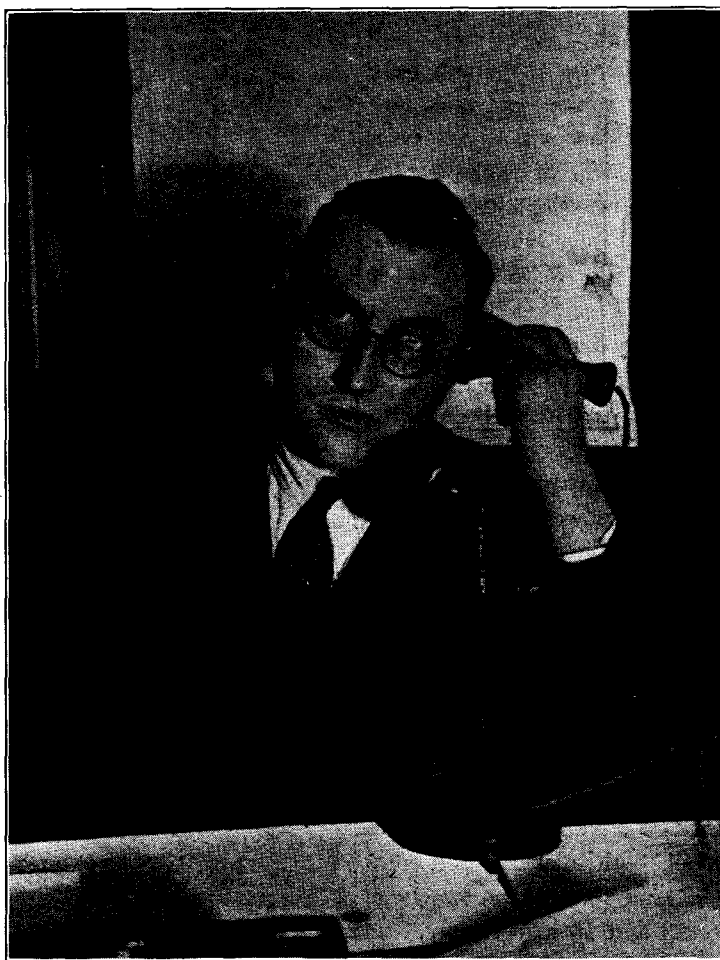
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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXXIII.—MR. H. F. SAMBROOK.

MR. SAMBROOK, who has recently been promoted to the rank of Assistant Secretary in charge of the Inland Telegraph Branch of the Secretary's Office, began his official career in 1909, when he joined the Secretary's Office as a Higher Division Clerk. He did not have to wait long for a position of distinction: within about a year of his first appointment he was selected to be Assistant Private Secretary to the Postmaster-General and subsequently he became Private Secretary to the Assistant Postmaster-General.

After the war—during which he served in the Army Postal Service on the Western Front—his work lay for a long period in the Staff Branch, where it fell to his lot to deal with many of the varied problems which awaited settlement. Prominent among these was the introduction of Whitleyism into the Post Office, and Mr. Sambrook was appointed Official Side Secretary of the Departmental Whitley Council. This position kept him in close touch with the burning questions of the day affecting staff organisation; and he became a well-known and approachable figure to representatives of the staff with whom



he was constantly brought into contact. One of the most striking qualities which he exhibited was the rapidity with which he grasped the main essentials of a problem in hand—this gift he showed in a marked degree, and as a result pressure of work has held no terrors for him.

From the Staff Branch he went to the Mails Branch, where he remained until his recent promotion.

In his new sphere of duty he will succeed Mr. Simon as Chairman of the Joint Committee which is considering the application of the recommendations of the American Mission on Inland Telegraphs.

Ever since 1921 he has found time to organise the collection throughout the Post Office of contributions towards the Children's Saturday Holiday Fund, and countless poor children doubtless owe him a debt of gratitude for his efforts on their behalf. Of his leisure hours Mr. Sambrook speaks little. He is known to drive a car, and among his other interests he is a keen reader of scientific literature, his knowledge of which will no doubt prove of great value to him in his new Branch.

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable as use, but he will take the utmost care to return such manuscripts to promptly as possible. Photographs illustrating accepted articles will be returned if desired.

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RURAL DEVELOPMENT.

THE brief record in the Retrospect published in our last issue of the fact that upwards of 200 rural automatic exchanges were opened in this country during 1930, hardly conveys an adequate impression of the extent of rural development which has been rendered possible by the adoption of this form of exchange for small places. As recently as 25 years ago, rural telephone development was only beginning. In fact it was then almost entirely confined to such rural places as were within a comparatively short distance of the larger towns. Well-known market towns and important villages lying some distance away from manufacturing towns, county towns, and sea-side resorts, had no telephone exchange at all. It is true that by 1903 or 1904 the Post Office had embarked on a scheme for extending the service to small country towns, and the National Telephone Company had followed suit within the areas to which their activities were confined, but it may fairly be claimed that this work of expansion was in its infancy a quarter of a century ago. Not until 1905 were exchanges opened at such well-known towns as Wimborne, Swanage, Banbury, Brackley, Maldon, Oakham, Romsey and Calne. Wareham, Appleby, Bodmin, Lynton, Filey, Westbury, Wootton Bassett, and Wantage received their first exchange in 1906, and Malmesbury, Wenlock, North Walsham and others in 1907. A glance at an article in the *National Telephone Journal* in 1907 on the geographical distribution of the telephone by counties shows that Shropshire then possessed only 15 exchanges in all, both in urban and rural districts, Dorset 13, Suffolk 23, Cumberland 13, and the two large counties of Lincoln and Norfolk only 23 and 19 respectively.

In the last two years alone, 14 rural automatic exchanges have been opened in Shropshire, 8 in Dorset, 14 in Suffolk, 5 in Cumberland, 14 in Lincoln, and 15 in Norfolk.

Within that short period upwards of 300 such exchanges have been opened in 68 counties, of which Yorkshire naturally has the largest share (31), while in addition to the shires already mentioned, Hampshire claims 10, Essex and Staffordshire 8, Devon 7, and the Scottish counties of Aberdeen 11, Ayr 9, Dumfries 8, and Forfar and Argyll 7. These exchanges are, of course, in no case established within the area of an urban district, small borough, or well-known market town. They have been opened in villages the majority of which possess no railway station, places whose very names are known only locally, or to the topographer, the antiquary, the curious, and the lover of quaint name-places. Such places as Stickney, Yardley Gobion, Copdock, Sigglesworth, Kirkgunzeon, Great Tew, Brent Pelham, and Cerne Abbas—to name a few—each have a population of a few hundred only, others like Bubwith and Gamlingay have between one and two thousand—a small enough figure by present standards of population. In places like these, therefore, exchanges with between 8 and upwards of 40 subscribers have been opened to the number of 300 within the last two years. If support for an exchange can be obtained in a village with 250 inhabitants, representing perhaps 30 or 40 families, many of them labourers, there seems to be every prospect that every village in the country of that modest magnitude, unless handicapped by exceptional conditions, will be “on the telephone” in the near future.

HIC ET UBIQUE.

MAJOR H. F. SAMBROOK, Principal, Secretary's Office, has been appointed Assistant Secretary in charge of Inland Telegraphs. We offer him our hearty congratulations.

We also have pleasure in congratulating the following recipients of New Year's Honours:—

Mr. W. H. U. Napier, Controller, London Telephone Service, C.B.E.
Mr. G. Kay, Assistant Accountant-General, O.B.E.
Miss Agnes Cox, Superintendent, Female Exchange Staff, London Telephone Service, M.B.E.

The actual total number of telephones in use in Great Britain and Northern Ireland at Dec. 31 last was as follows:—

P.O. system	1,957,690
Hull Corporation system	16,600
States of Guernsey „	4,384
„ Jersey „	3,687
Privately owned stations	14,144
Total	1,996,505

On Jan. 7 the centenary of the birth of Heinrich von Stephan was celebrated in Berlin. Dr. von Stephan is one of the most famous of postal administrators. One of his first achievements

was to carry through the transfer of the Thurn and Taxis postal system to the Prussian Post Office. In the old days of the "Holy Roman Empire," which came to an end in 1806, the posts were the privilege of the Princes of Thurn and Taxis, and it is somewhat surprising to find that the Taxis system endured in many of the states of the Germanic Confederation until 1867. Stephan became Director-General of Posts of the North German Confederation in 1876, and of the new German Empire in 1871. He was made honorary Doctor of the University of Halle in 1873, called to the Prussian House of Lords in 1872, made Staatsrat in 1884, and ennobled in 1885. He is claimed to be the creator of the World Postal Union, which arose after the Paris Congress of 1878. Besides his distinguished work after the acquisition of the telegraphs by the German Post Office in 1876, von Stephan is known as one of the pioneers of the telephone in Europe. He realised its potentialities at once, and it may be claimed that the experimental service he established in 1877 over certain rural telegraph circuits to small offices in Prussia was the earliest public telephone service given in Europe.

Most of the German technical journals refer at some length to the Stephan centenary. It is interesting to learn from *Telegraphen-Praxis*, Lübeck, that Stephan planned a telephone service for Berlin in 1877, but it was turned down by the Police-President! Not until 1881 was the Berlin exchange opened with 48 subscribers, by which time Mülhausen (Alsace) was actually ahead of it with 71 subscribers. Nevertheless, in 1888, Berlin had more subscribers than any American city, and 10 years after that more subscribers than there were in the whole of France.

According to *The Electrical Review*, it is stated that the Siemens & Halske Co., the Felten & Guillaume Co., and the Standard Elektrizitäts Gesellschaft have submitted a joint offer to the Government of Jugo-Slavia for the construction of a long-distance telephone network in that country at a cost of 12,000,000 dollars, together with telephone exchanges. The work would occupy a period of seven years, and a credit of twelve years is said to be under consideration. The Standard Elektrizitäts Gesellschaft was formed jointly by the International Telephone and Telegraph Corporation and the Berlin A.E.G.

In the view of "Phipps" of the *Daily Mail*, the change of telephonic title is the latest of several coups recently brought off by the G.P.O. This institution, indeed, has been quite promiscuously tying labels round its subscribers' necks.

Wandsworth, for instance, has been invested with a literary cachet which it hardly knows what to do with. Wandsworth is now "Macaulay" and trying hard to assume an air of Ancient Rome. Subscribers are rapidly acquiring Lars Porsena accents, and learning to hold the line at least as tenaciously as Horatius held his bridge.

Upper Norwood, usually a distinctly Temperate Zone, has been given the tropical telephone name of "Livingstone" and promptly gone native.

Broken-hearted suitors will in future be able to save time and money by going on safari—within easy reach of the West End.

Then there is the case of Cricklewood, which at a touch of the G.P.O.'s wand became "Gladstone." I understand that this liberal gesture has given a marked parliamentary tinge to Cricklewood subscribers and that they are now addressing friends over the wire as "Mr. Speaker."

Moreover, on hundreds of Cricklewood hearthrugs fathers are demanding of cowering families: "What did I say in '84?"

Says the *Morning Post* under the heading "Temperament and Tuxedos":—

Alterations have been made in the original B.B.C. plans for their new headquarters to provide even changing-rooms for broadcasters to change into suitable costumes to give tone to their efforts through the microphone. But it is a mistake to suppose that only broadcast artists require this temperamental tonic. I long ago adopted the plan of changing my costume for every paragraph written, and I am shortly installing a high-power gramophone to provide the necessary music to help me to give of my best. It is, of course, impossible for me to write revelations of high life unless I am in full evening dress, with decorations.

We understand that our regular contributor, J. J. T., is considering a costume composed mainly of Wheatstone slip with festoons of cable and a surround of siphons.

A correspondent in the *Daily Express* who "read with interest the account of the slow increase of the use of the telephone in London," says: "I went to the United States in 1880, and while in Denver, Colorado, I telephoned 500 miles to Kansas City, and many houses in Denver then had private telephones."

This gentleman must be accounted fortunate, considering that sufficient progress had been made in America to speak over 45 miles distance in 1880, and over a distance of 235 miles in 1884. And here was he in the wild west of 1880 talking across 500 miles. Some people's luck is only exceeded by their imagination!

(Perhaps, however, he means that he went to the States in 1880, but only reached Denver in 1920 or 1930?)

The following letter has been received by the Postmaster of Blyth, from the Hughes Bolekow Shipbuilding Co. Ltd.

We should like to express our appreciation of the considerable assistance which your telephone staff gave us during the recent disastrous fire on the *s.s. Empress of Scotland*.

Our telephone was almost continuously in use during that period, and despite the heavy calls made on your staff we received from them unflinching courtesy and genuine helpfulness during the whole of the time.

This expression of appreciation was, of course, conveyed to the staff concerned.

The following characteristic letter apropos of "Watch Dog and Horse," is from a well-known telephone pioneer whose identity will perhaps be guessed by many of our readers.

TO THE EDITOR OF THE "TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—In your November issue your "erratic correspondent" points out the difficulties of a district manager who has to do his work without either a horse or a dog. Of course, this applies to Government service, because both the horse and the dog performed useful service in the olden days. Should the P.M.G. act on the hint from your correspondent, please don't let him claim novelty.

In the 'eighties when competition was very keen between the P.O. and the companies, the former claimed that it could put up a certain line by a certain date, and also kindly told the would-be subscriber that it was impossible for the company to do it in the time, as the P.O. had the route complete but the company would have to build it all and it was several miles (15 or 18).

The company got the order and to get through in time had to transfer gangs from all adjacent districts and hire a "hunter" from the local hunting stables for the chief engineer, who, fortunately, was a good horseman.

The manager also hired a horse occasionally for inspection purposes. The line was handed over in good time notwithstanding a snow storm, and the Post Office had the pleasure later on of buying this line from the company. It was claimed that the horse was necessary.

Now about the dog. A long-distance experiment was being made from London to Liverpool. The writer was in Liverpool and had his dog with him. The transmission was very poor, railway lines with earth return being used. The dog was "trained somehow" to speak when told to—he was put on the table and spoke to London and was heard much more clearly than his master.

This is claimed to be the first time a mounted engineer was employed on telephone construction and the first dog trained to speak through a telephone.—Yours,

"GEE GEE" AND "BOW-WOW."

POST OFFICE ENGINEERING CONTRACTS.

By G. W. BELL (*Engineer-in-Chief's Office, G.P.O.*)

(Continued from page 72.)

Passing of Property.—It may be convenient here to mention a very interesting question, of which I should like special note to be taken. It is a matter which arises as between the Postmaster-General and his contractors when damage is caused by third parties to plant under construction for the Post Office. The problem is that of ownership in the plant at the time the damage takes place, and upon a settlement of this depends the incidence of the liability to claim, or institute proceedings against the person causing the damage. For example, the Department contracts to take over a main cable from the contractor after certain prescribed tests have been passed satisfactorily. If before it is so taken over, any undertaker working on the road drives a fencing pin or a rod into the cable, the claim is one for the Department's contractor to make; but if the cable has been accepted, property in it having thus passed to the Postmaster-General, the latter should make the claim. At the time of the Holborn explosion, the London—Maidenhead cable, nearly completed, was still regarded as the contractor's property, although much of it had been paid for at works, and the contractor was informed that it was for him to claim against the parties concerned.

*Under (b) Regulations of Highway Authorities.**—The contractor is required, unless otherwise directed by the Postmaster-General, to conform to all regulations of any Local Authority having control of the public highway concerned in the contract work. These regulations sometimes include the flagging and control of traffic by arrangement with Police Authorities, the temporary suspension of traffic and the occasional closing of side roads.

Practice differs in the many areas in which the Department's work is carried out. Under recent legislation, the number of small independent authorities has been largely reduced.

Under (c) Fair Wages Resolution of the House of Commons 10/3/1909.—All contractors for Government works (and indeed for most local authorities) must pay such rates of wages and observe hours of labour as are recognised by good employers and trade societies in the district concerned. Subletting is not permitted unless customary in the trade when permission must be obtained from the Engineer-in-Chief. Wages books are inspected on all contract works. In case of proved infringement the contractor is liable to pay £50 as liquidated damages.

There is now very little trouble in the matter of rates of wages and hours of labour on Post Office Engineering contracts, as in most of the trades concerned these matters are the subject of collective agreement.

The majority of the complaints of alleged breach of the Fair Wages condition now made are either from workmen who, engaged in the public works and civil engineering industries, seek to force up a district rate to that which is recognised in the building industry, or from watchmen whose rates of remuneration differ in various localities. The building industry is better organised than are the others mentioned, its rates of wages are higher and unemployment is not at such a high figure. At the moment the figures of unemployment amongst members of trades unions are 12% in the building trade, and 25% in the public works and civil engineering industries.

All important contracts placed by Government Departments are announced monthly in the Ministry of Labour Gazette for the information of Trades Unions to assist their members amongst other objects, in the recruitment of labour.

The Fair Wages Committee, composed of responsible heads in various Government Departments, deals with questions of a general character which are referred to it.

Under (d) the Government's Communication regarding Workmen from Distressed Areas.—The Government expressed a desire that miners or work-people in all trades skilled and unskilled from "distressed" areas should be given opportunities of employment, and this desire has been brought to the notice of the Department's contractors. Unfortunately there are few areas which are not now distressed owing to unemployment.

Under (e) Various Acts of Parliament.—The contractor is required specifically to observe the provisions of the Bribery Acts, for breach of which severe penalties are attached, and also the House of Commons Disqualification Acts. The reference of outstanding matters which may still be in dispute on completion of works to arbitration under the provisions of the Arbitration Acts is a matter of agreement between the Postmaster-General and his contractors.

Under (f) Public Authorities Protection Act of 1893.—Under this Act the Postmaster-General and his officers are protected against action, prosecution or proceeding in respect of alleged neglect or default in the execution of any Act of Parliament, duty or authority, unless commenced within six months next after the act, neglect, or default complained of, or, in case of a continuance of injury or damage, within six months next after the ceasing thereof.

* Regulations as to opening and filling-in ground (a) and (b) are referred to at the foot of p. 71 (January issue).

XI.—Underground Work—Typical Difficulties and Disputes.—Artifices of Certain Contractors.

This type of work has afforded scope for the ingenuity of contractors. The struggle between gun and shell, and armour plate is a parallel on a heavy scale to our mild contests.

Extra Widths of Excavation due to Extra Depths.—For many years the Department paid separately for extra widths of trench excavated beyond a certain standard, for the portion of the work down to normal depth, when excavations deeper than those prescribed had to be made owing to obstructions. This standard was defined as the contractors' own performance. The contractor would, of course, in actual practice, in order to save the cost of reinstatement of pavings, cut trenches as narrow as possible, and the Department would reap the advantage in the low competitive prices which he would tender.

It should be explained that below standard depth all necessary widths and depths are paid for as an extra.

But instead of adherence to this standard we frequently found in some districts that verbal arrangements had been attempted on the job before work started to fix narrow arbitrary widths for the numbers of ducts concerned, the intention being eventually for extra widths to be claimed according to the depth of excavation, whether these were actually necessary or not.

These pleasant diversions were subsequently countered by requiring the contractor to cover necessary enlargements of trench in his prices per yard tendered for the work at the normal depth specified in the contract. The Department's employees were thus relieved from the continual differences with the contractors' agents on the job, the contractor being controlled from headquarters by the inclusive competitive prices. This alteration of the basis of tendering has also not only simplified the recording and certification of works and the check of accounts, but has also, under good competition, prevented prices per yard of work from rising and has reduced the cost of works by the diminution of "extras."

Diverse Nomenclature of Pavings.—Claiming that the scheduled pavings varied from the Department's descriptions, contractors often make opportunities to ask extra payment. Roads treated or laid with many varieties of expensive bitumen and asphalt, with or without foundations of concrete of various depths, are examples. Yardages are sometimes considerable. The Department, being the piper "calls the tune" to some extent, of course, but no adjusting rates are admitted which are not justified under the contract. The importance of care at the survey stage to secure that works are correctly described for tendering purposes is obvious.

Time Work.—Certain legally minded contractors have argued that the removal of earth in "spoonsful" from places densely congested with pipes is not excavation and that therefore they should be paid at "time" rates.

Contractors sometimes desire to transfer risks from their responsibility under the inclusive prices in the contract, to the Department, under "time" conditions, which risks they presume would be paid for as they mature. This explains why some contractors even threaten to stop work to enforce their will. In this we do not give way.

Abnormal Work.—Special difficulties arise when ground falls away during excavation, when running sand is met with and extensive timbering is required, when water springs, tidal effects and floodings occur, and when heavy rains scour trenches as in grass margins, when trenches sited downhill become watercourses and manholes become filled with water.

The question of the supply of additional ballast or concrete for consolidation of the work has to be carefully considered and the extent of the contractor's or the Department's liability for the cost largely depends upon the facts as reported by the supervising engineers. Clays disturbed in wet weather are very difficult to consolidate. Abnormal work due to floods &c. is not paid for as an extra, excepting at manhole sites.

Rock.—Some years ago Treasury authority was obtained to relieve certain contractors of heavy losses incurred owing to large quantities of rock found unexpectedly in the trenches excavated by them.

Provision was thereafter made in contracts to pay separately for virgin rock excavated. This measure of relief to contractors has been used by some to attempt to gain extra payment whether or not legitimately earned. Friable or otherwise easily worked chalk is one of the favourites, and we have been supplied with specially selected samples, and with definitions from geologists in support of claims. Unmoved we usually refuse and tell contractors that it may become necessary if they persist in such claims to revert in future to our previous practice of not paying for rock as an extra.

The subject of rock is very interesting. Its nature, texture, strata, formation in relation to the trench line, the effect upon it of exposure to air in some cases, the fact that of very hard rocks patches are found to be extremely soft, the methods and time taken in removing it and costs, render the problems attractive.

Contractors have claimed unsuccessfully extra payment for the supply of hard material for consolidating weaker sections of trench, in respect of rock inserted which had been excavated by them from adjoining trenches. In such cases where considerable extra cartage has been involved, allowance for this service has been made.

Mechanical Consolidation of Trenches.—A measure of success has attended the recent alternative stipulation for the consolidation of trenches. By the use of mechanical punners as the filling-in proceeds, or the application of the rear wheel of a steamroller of moderate weight when the filling-in is

nearing completion, it is possible to return a very large proportion of the excavated material to the trench and to leave the ground in a satisfactory state for traffic pending permanent reinstatement of the surfaces. The heavy costs resulting from trenches sinking necessitating several reinstatements and maintenance attention, or the use of additional concrete in trenches, have thus been avoided in many cases. A saving is also effected by the reduction in the quantity of surplus earth carted away. A little further pressure upon contractors for the more general adoption of mechanical means of consolidation on important works in other than congested areas is becoming advisable.

It will have been appreciated, from what has been stated, that the supervision of contractors' work in progress on the site demands unremitting and serious attention by officers who should be well-trained, enthusiastic, painstaking, and intelligent in order that the Department's interests may be firmly maintained.

The officers selected should be acquainted with their contract, should know when to submit questions for advice or decision, should be capable of writing concise reports, and they should in all cases be supported by regular periodical visits from responsible engineering officers, as prescribed by the Department's standing instructions.

XII.—Some Interesting Features of Underground Work.

Certain curious features occur in the Department's underground work. This type of plant might be said to do all but talk! For example (a) cables creep in the conduits in certain roads due to vibration caused by very heavy traffic, and in other cases an enemy attacks the lead sheath, (b) conduit lines grow in length, (c) they have on occasion been known to tilt and turn over during construction, (d) they have been found to be laid in sinuous form, and (e) they sink to lower levels—

- (a) This strange phenomenon of motion both uphill and downhill has occurred when the cables are well supported in manholes, and even when anti-creeping blocks are fixed; and creeping takes place both in the direction of the line of traffic and against it. The enemy referred to is electrical leakage from power mains which in certain circumstances attacks the lead sheaths of cables and destroys them.
- (b) This is due to spigots of ducts not being driven completely home into the sockets when laid. Thus the small gain in length on each duct may become appreciable in long sections.
- (c) The cause of this is a fault in the bitumen lining of the ducts which prevents them being laid "true," the ducts having escaped observation before laying.
- (d) This has happened in rare cases due to inexperienced supervisors requiring the normal uniform depth in relation to the surface to be maintained, even though the surface, such as that of roadside grass margins, was wavy in contour. The ducts had to be relaid as no cable could be drawn into such a duct line.
- (e) This is due to the activity of treacherous wet clay subsoil.

XIII.—Miscellaneous Matters of Interest.

Brief reference is also made to several matters of interest.

Unemployment Relief Schemes.—Contracts for duct and cabling works of substantial values have been made during most of the years between 1921/22 and 1928/29 in order to relieve unemployment in the winter months. Arising out of the unfortunate national labour situation a little difficulty has at times occurred owing to the competing claims of the various auxiliary agencies. For example, that interested in unemployed local labour and that of the ex-servicemen's organisations have felt some hesitancy regarding the transference for Post Office works of miners and others from depressed areas to their towns, to the use of navvy labour, some of it Irish, which migrates from place to place, and also to the nucleus staffs brought into towns by our contractors to form gangs for their outdoor works.

British, Empire and Foreign Manufacture.—It is the Department's policy to obtain materials in this country, or within the Empire wherever possible, and its specifications are drawn to provide for such supplies. The values of foreign manufactured materials supplied under this Department's contracts during the past three years represent annually not more than 0.07% of the total value of the contracts placed.

British Engineering Standards Association.—The Department's policy is to stipulate for the use of materials of British Standards production whenever these meet the technical requirements, and provision is now made in all types of contracts for such supplies as are practicable.

XIV.—Devolution of Contract Work to Superintending Engineers.

The making of engineering contracts has been devolved within certain limits to superintending engineers.

Devolution has been the rule for some years in matters of normal organisation in the Engineering Department. The fundamental difference which exists when outside contracting interests are concerned, however, is not always apparent when suggestions are made further to devolve contract work to superintending engineers.

Power is gained, and control of contractors effected largely from the contractual relationship established by inviting tenders and making contracts.

The controlling mind at headquarters has knowledge of all important dealings both in matters of principle and of detail. He is at the centre, and the fewer the persons who hold and exercise power the more efficient is the control.

To distribute central power to the circumference (a position occupied by the various superintending engineers relatively to each other and to the Engineer-in-Chief), would emaciate contract control. This view casts, of course, no reflection on any district: it is not a matter of personnel but purely one of organisation.

The regulation of tendering, including matters of adequate competition and economies in cost of works, the consideration of the degree of competence and capacity, financial and otherwise, of contractors to undertake works of certain grades and values, the knowledge of the positions in the country at which contractors are working and of the value of works in hand, are essential factors which indicate the need for maintaining undiminished, effective control at the centre, where full acquaintance with all the facts and results alone is obtained.

When contractors become financially embarrassed prompt and authoritative action in all districts concerned can only be exercised effectually by centralised control.

As contractors naturally attempt to apply a decision given in one district to contracts elsewhere if it favours them, and as it is not an easy matter even in the most favourable circumstances to preserve consistency of interpretation in the many questions arising on contract works, the reasons for the conviction expressed in this paper will be apparent.

XV.—Accountability and Various Departmental Contract Safeguards.

The outside limit of authorised expenditure for every contract is the works estimate prepared by the Superintending Engineer. Works estimates for conduit laying works are based on average contract prices supplied from headquarters as a uniform guide to be supplemented by local knowledge. A comparison has been made of the amount allowed for the contract work in the works estimate, the estimated value of the contract, and the amount paid in 280 of the most recently completed contracts for work of this class in all districts.

Works of a total value of over half a million sterling were thus compared with the following overall results shown on a percentage basis:—

<i>Works Estimates (Contract Work) Figure taken as</i>	<i>Estimated Value of Contracts.</i>	<i>Payments under Contracts.</i>
100	94.11	93.35

The results, district by district, which compose this overall result were also uniformly satisfactory.

Contractors' work is supervised at various stages by workmen, inspectors and engineers, who initial daily the record made in the diary of work done by the contractor. The copy of the contract supplied for the purpose of supervision of contract work on the site by subordinate officers contains no prices. The fact that certain work is recorded in the diary does not necessarily establish a contractor's claim to be paid on a certain basis and misconceptions sometimes occur in this connexion.

The certification of all claims is governed by contract terms and conditions. Quantities of work done, and quality of work, are "certified" by the Sectional Engineer's signature on the account; but in the main the calculations, and the agreement of the accounts containing extras, with contract conditions, are matters for the Superintending Engineer's office. The overall controlling scrutiny of accounts to secure uniform and correct interpretation of contract is applied by headquarters officers.

Final payments are not made to contractors until all known liabilities have been discharged by them. These liabilities include the satisfactory condition of roads or working of plant as the case may be during the relative maintenance period. This period differs in various types of work, but in underground works the maintenance period which is statutory, is six months.

Progress of contractors' work is closely watched, and the question of liability for liquidated damages in cases of delay for which a contractor can be held responsible has to be investigated on all contracts. There is an exception, however, in the case of buildings for rural automatic exchanges, in which case the non-fulfilment of contract clause has not been used. There are still telephone engineers whose official temperature curve rises steeply when the subject of liquidated damages for delay is mentioned, until they grasp that this aspect of contracting accountability is laid down as a matter of high policy.

Attempts to withdraw from a contract are sometimes made by contractors, but when the financial liability attending such a proposal is pointed out it is usual for them to proceed with the work.

Contractors are held strictly to the quality of work specified. They may, if they wish, ask for an independent examination of the work complained of, but this rarely occurs. Arbitration under our contracts can only be resorted to on completion of a contract work. Two cases only have actually taken place, in one of which the Arbitrator was an Assistant Engineer-in-Chief. A third case is now in hand.

For the successful handling of contract matters and accounts, seeing that there are many contractors working under different Post Office engineers, the importance of uniformity and propriety of interpretation for all districts

will be realised. Contractors are quick to seize on decisions of an inconsistent nature which may have been given in their favour in particular districts and to attempt their application elsewhere. This indicates that a strong control at headquarters is indispensable, and it can only be maintained by employing officers with long experience. It follows also from this why important questions as to relaxation in the interpretation of contract clauses are not allowed to be decided locally.

The Department is safeguarded in respect of its statutory liabilities, e.g., for reinstatement of pavings, damage, &c., by the exercise of power not only to deduct amounts from Contractor's accounts, but to pay to the proper claimants sums due after approval by the contractors, out of moneys otherwise payable to the latter. Suitable sums are held until the Department and the Highway Authority are satisfied with the condition of the work at the expiry of the maintenance period.

When contractors experience financial difficulties, reconstruct their business, wind up, or become bankrupt, considerable care is necessary. They naturally give no longer notice of such eventualities than they can help. Not long ago one of our contractors experienced heavy losses on operations outside the Department, and his business suddenly collapsed and was wound up. He held over a score of contracts with the Engineer-in-Chief but on most of these, fortunately, the bulk of the constructional work was done.

As part of the financial control of contract work returns are rendered yearly showing the contracts made, in which tenders other than the lowest had been accepted, and also of works placed without competition.

Competition for conduit laying and lighting works is very keen, but in the cable making and accumulator industries "rings" exist. Agreed prices for main telephone cables have been arranged with the Cable Makers' Association to hold good for a period of two years. The provisional arrangements being made with the telephone equipment manufacturers as regards the distribution of works at reduced prices, in respect of orders placed during a period of five years, have already been announced in an official publication.

Statistics of costs of the Department's contract works of various kinds are prepared periodically for accounting purposes.

To co-ordinate action amongst the various State contracting and purchasing Departments, a Committee meets periodically on which representatives of the Treasury, Admiralty, War Department, Air Ministry, Post Office, &c., serve.

The Exchequer and Audit Department's officers visit the Engineer-in-Chief's office and make detailed examinations annually of contracts and matters relating thereto. Explanations on all points are given verbally by responsible contract officers, and accepted after discussion, and no written auditor's query relating to contracts has been received by the Engineer-in-Chief for many years. This result considered in reference to all officers engaged in contract work in the districts and at headquarters speaks for itself.

Test audits are also made by members of the staff of the Comptroller and Accountant General's Department, both at headquarters and in Superintending Engineers' districts, in order to satisfy the requirements of that department as outlined in an opening section of this paper.

XVI.—*The Office Window.*

I will now give you a few impressions of experiences of the contract work formed in everyday touch with it during a period of more than a score of years.

Most people are moulded to a greater or less extent by circumstances and may thus learn a great deal about contract work, but it is my definite conviction that a natural aptitude is a very great advantage if the problems of this type of business are to be handled successfully.

First of all the responsible position is of a fiduciary nature. The works contract officer stands for the Administration as between the Engineer-in-Chief and the various contractors with which the Department co-operates or conflicts, as occasion demands. Absolute impartiality must be maintained in relations with all contractors, and even more scrupulous care should be applied to Departmental spendings than to one's own financial interests. These and kindred guiding lines help to form what one might call the contract spirit, and to create a tradition for the contract staff.

The business days are full of interesting experience with contractors large and small, men of all types of mind, training and experience, whose characteristics need to be studied, and this is a matter which is not acquired in a day. We have contractors who delight in writing essays based often on theory with but a distant relation to the facts which count, and it is entertaining to bring them to earth. Incidentally it may be stated that free use is made of interviews in preference to letter writing as a short cut to settlement of questions raised, the results being confirmed by letter.

Experience leads the works contract officer to an attitude of mind which in time becomes second nature to him, to be expressed, of course, in the official, but not, it may be hoped, in the domestic circle. That attitude is one of criticism, which if applied first to himself will be the more appropriately applied to his opposite number, the contractor. He has to sort out the many things said to him, and to "prove all things, holding fast that which is good." Almost every decision taken may create a precedent, and precedents are "stubborn chieftains."

It is a matter for congratulation that the Postmaster-General is on the whole so excellently served by his works contractors. In cases of sudden

emergency, works are needed to be undertaken at a moment's notice at times involving deep or other risky operations, and there is hardly a limit to the willing and skilful efforts that contractors will make, when desired to do so by the responsible contract officer.

The counterpart of the question of the Administration's confidence in its contractors is that contractors must have confidence in the Administration if the best results are to be achieved. This mutual confidence is not gained in a day and it must subsist during long periods. The necessity of straightforward dealings and the avoidance of all "catchpenny" methods in everyday business impress themselves upon all officers. It is on record that the French Minister, Colbert, said, "the art of taxation is the art of plucking the goose so as to get the largest amount of feathers with the least possible squealing." We are not, however, prepared to plead guilty to holding such a view, so far as the art of contracting is concerned.

The contract staff does not expect to satisfy everybody either within or outside the Department. It is under considerable potential and actual criticism from many sides, but it is its business to go ahead in circumstances when "all men" do not "speak well" of it. Many have been the keen tussles with contractors of "fine subtlety and wide ambition," but it is only in rare cases that there is failure to maintain the most pleasant relations. Contractors sometimes write us letters in complimentary terms which we file with a wan smile. But I think you will be much more interested in several incidents showing the other side, which will give indications of the attractive and varied character of the contract duties.

On a recent occasion a highly mercurial and stalwart contractor from the Principality, after writing to say that my esteemed predecessor and the Superintending Engineer concerned did not know what they were talking about, called in and gave every indication that he might be tempted to administer corporal chastisement to the staff because we could not accept his views. Almost weeping with righteous (!) anger, he considered that we judged him to be perverting the truth. He had written the Superintending Engineer "There is no doubt that I have dropped into a very hot shop," and later he wrote us: "It is said that life is a melody if we hum the tune, but the contents of your letter of . . . are so audacious that they pitch a very discordant note." I have subsequently written pressing him to come and discuss a settlement, but so far without success. My predecessor was convinced that this man was badly affected by what he called the "nonconformist conscience."

Another contractor for conduit laying work wrote quaintly that "the question of liquidated damages seems to have become a hobby horse of the Department with the object of embarrassing the contractor who has to put up with 'various difficulties' for which he can obtain no compensation under the contract."

Recently we received a letter from one of our best contractors who is under a definite liability in respect of damage done in consequence of his works, which was discovered several years after he had left the site. I should like to read the relevant extracts from the letter and I think you will agree it is pleasantly phrased to conceal a little disgust with us. To know the author enables one fully to appreciate his invariably refined suavity.

In the letter the contractor referred to damage to a private road on a work done by the Department's own men near his premises and in which he had a personal interest. He considered the Superintending Engineer had taken a different line by repudiating responsibility after a long period, from that taken by the Engineer-in-Chief, in regard to his (the contractor's) own liability to the Department:—

Extract from Contractor's Letter of 22/10/30.—"It is evident that, in practice, lapse of time has some softening influences upon the terms of the Department's contracts or statutory obligations.

"We agree that we have always footed the bill where claims have been made upon us, irrespective of the lapse of time—for damage to property below the ground where it was reasonable to assume that the damage was caused by our operations. We do this purely as a matter of business morality—endeavouring to be fair and square to others. We guarantee our work to our customers, and repair or replace defective work in order to keep up our reputation.

"We would agree to pay the cost here if we had been negligent, or had caused the damage. If the Department insist that we repay the damage—the Department may, of course, refund itself out of contract monies which they have on hand. To this course we shall offer no opposition, but we must beg to be excused from giving our approval. We do not agree that the terms of the Department's contracts amount to a life sentence like matrimony!"

Even our emotions are stirred as tales of woe reach us from contractors in distress due to definitely genuine causes. Fortunately these troubles are of rare occurrence, but in many tales by contractors of alleged losses, we understand that the profit has not been as great as was anticipated. We murmur "swings and roundabouts" or "rough with the smooth" to our disconsolate listeners, and sometimes as a variation we suggest almost regretfully that contractors never offer to share with us, i.e., the Department of course, the extraordinary profits which must fall into their lap on occasion. At the top of the octave, we may remark that a very callous Treasury, before it would be willing to listen to a recital of losses, would have to be assured that a contractor's general business dealings during the year have resulted in a loss. For persons placed in predicaments of this kind how useful would be the following acquisitions or characteristics:—

A wise head, a sympathetic ear, a cheerful face, a balanced mind, an impartial judgment, a discreet or silent tongue, and a stony heart for alleged "stony" contractors.

Without encouraging tittle-tattle, the contracts staff gains orally from contractors useful information from time to time which is turned to profitable account in regard to future works.

It is sometimes supposed by officers who are not experienced in contracting work that contractors' rights can be lightly subordinated to the will of officials. Departmental regulations not related to contract terms are sometimes mistakenly pressed into service. Contractors, of course, have their rights under contracts equally with the Postmaster-General, and while in the Department's dealings, its own side of the bargain is maintained, full weight must be given to the other side.

As to the organisation of the work in the Contracts Section the staff is trained first in drafting and inviting tenders, then in the pricing out and adjudication of tenders, a duty involving, i.e., a thorough knowledge of prices, then in preparing contracts for signature, and the consideration of the tenders and documents by officers working independently at these stages is calculated to secure a satisfactory result. The knowledge gained in this training becomes useful in the scrutiny of accounts, in matters of progress of works, investigations and in the interpretation of contracts. In turn, experiences on these latter duties are made available with the tendering side.

The more important work is semi-technical and quasi-legal in character, and it involves questions affecting different industries. The ability to handle these questions readily, the exercise of precision and care in thought and in the use of words, in correspondence, in conducting interviews and appropriately recording the results, are some of the essentials to success. All officers engaged on the more important contract duties have had a good many years' experience in all phases of the work. They have a thorough knowledge both of principles and of details, and in contract work care in detail is of prime importance. Any documentary records may become crucial if legal disputes arise, and this possibility is kept in mind habitually.

The general oversight of the work of the Contracts Section is facilitated by the use of weekly control summaries. These are prepared in sufficient detail to show at a glance the position of the work upon which the sub-sections are engaged.

Thus the output of tenders and contracts, progress of commitment against anticipated expenditure, certification of accounts and so forth are under constant review.

The various grades of the staff are expected to take their full measure of responsibility, and the periodical interchange of duties is arranged in order to enable officers to freshen up their knowledge and experience. Tribute must here be borne to the keenness and enthusiasm of all the staff and to the excellent spirit of goodwill and co-operation which exists not only within our section but with colleagues elsewhere with whom we are in day-to-day relationships.

There are abundant opportunities for the staff to exercise its attainments in contract knowledge and for wit sharpening face to face with contractors many of whom do not hesitate to speak their mind, and whose own money and success are at stake. Co-operation with contractors is the rule, but when other situations arise, methods of attack and defence differing from anything akin to stereotyped departmental regulations are necessary, and tactics have to be varied to suit the type of case and contractor. We are not satisfied with holding our own merely, but regard it as a duty to use the last ounce of effort when all arguments have been exhausted to beat the contractor in his own line of business.

THE POST OFFICE ELECTRICAL ENGINEERS JOURNAL.

WE see from the January issue of our contemporary that its price will be reduced to 1s. commencing with the next issue. The journal maintains its usual high standard, and current issue strikes us as a particularly interesting one. Besides illustrated articles on Telegraph Instrument Room Methods, Voice Frequency Key-sending from "A" Positions, Power Distribution in Automatic Exchanges, Telegraph International 5 Unit Code, Applications of the Thermostat to Telegraph Circuits, The Anglo-Belgian Submarine Telephone Cable, and Notes on Telephone Transmission Theory, there are two interesting radio articles, and others of interest to non-technical readers on the development of the rural automatic exchange system from Cornwall to Inverness-shire, and on the Childhood of the Automatic. Incidentally it may be said that the illustrations are all excellent.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Nov. 30, 1930, was 1,947,184, representing an increase of 10,286 on the total at the end of the previous month.

The growth for the month of November is summarised below :—

Telephone Stations—	London.	Provinces.
Total at Nov. 30	699,080	1,248,104
Net increase for month	3,830	6,456
Residence Rate Subscribers—		
Total	175,811	273,659
Net increase	1,381	2,308
Call Office Stations (including Kiosks)—		
Total	6,544	27,038
Net increase	63	192
Kiosks—		
Total	2,114	7,364
Net increase	47	146
Rural Party Line Stations—		
Total	—	9,463
Rural Railway Stations connected with Exchange System—		
Total	17	1,885
Net increase	—	20

The total number of inland trunk calls dealt with in September, 1930 (the latest statistics available) was 10,242,793, representing an increase of 485,123, or 4.97% on the total for the corresponding month of the previous year.

Outgoing international calls in September, 1930, numbered 45,186 and incoming international calls 48,384, as compared with 44,011 and 47,636 respectively in September, 1929.

Further progress was made during the month of December, 1930, with the development of the local exchange system. New exchanges opened included the following :—

Addingham (Yorks), Applin (Oban), Auchleuchries (Aberdeen), Barrow (Norfolk), Baltonsborough (Somerset), Cumbernauld (Glasgow), Corsock (Castle-Douglas), Coddendam (Essex), Cardenden (Edinboro'), Daybrook (Glos.), Dunragit (Stranraer), Hingham (Norfolk), Lyth (Caithness), Martlaske (Norfolk), Monymusk (Aberdeen), Mossyard (Glasgow), Netherbury (Dorset), Polruan (Cornwall), Skirlaugh (Yorks), Southrepps (Norfolk), Seighford (Staffs), Tarbolton (Ayr), Tibthorpe (Yorks), Waterbeck (Lockerbie) all rural automatic; Radcliffe

and among the more important exchanges extended were :—

Chester, Clacton-on-Sea, and Mossley Hill.

During the month the following additions to the main underground system were completed and brought into use :—

Norwich—Wymondham,
Gloucester—Stroud,
Langley Mill—Alfreton,
London—St. Albans,

while 73 new overhead trunk circuits were completed, and 75 additional circuits were provided by means of spare wires in underground cables.

TELEGRAPHIC MEMORABILIA.

PERHAPS the most interesting item to place on record this month is the signing of the contract by the King of Hedjaz for the erection of fifteen wireless stations within the confines of his kingdom. The couplet—

“East is East and West is West,
But never the twain shall meet,”

has been rudely pushed aside, and even with accented accentuation, when it is realised that the Holy City of Mecca is to be invaded by this subtle means of communication.

Personal.—To the “F” Division Supervising Officers and Staff, many thanks for seasonal greetings which are most heartily reciprocated. Deeply regret to hear that the annual happy combination of Johnson and Young will have no chance of brightening the festive season in the future. To that ever-cheerful duo one would say ‘Tis better to have tried and lost, than never to have tried at all. Also thanks to a Retired Officer, who sent me a photograph of himself and four other — standing in swimming costume on the banks of the shivering Thames on Xmas Day at 8 a.m. The *Surrey Comet* was indulgent enough to make a copy of the feat, but the writer is ambitionless in that direction!

Promotions.—Quite a pleasant sight to read the December list of TS male promotions, actually running into double figures. Many would have risked the chance and have completed a baker's dozen with number 13!

Companies.—International Telephone and Telegraph Corporation. The quarterly dividend of 50 cents per share became payable on the 15th ult. Marconi's Wireless Telegraph Co., Ltd. A final dividend has been declared on the 7% participating preference shares in respect of year ended Dec. 31 last. Eastern Telegraph Co., Ltd. Dividend declared at rate of $3\frac{1}{2}\%$ per annum, less tax, on preference stock for last quarter 1930.

Obituary.—The announcement of the death of Mr. Leonard Weaver in his 84th year could only be of personal interest to but a very few. Mr. Weaver's name, however, recalls the early status of the Controller's Office staff, which was made a separate establishment in 1894 with the late Mr. R. Boxall as Chief Clerk. Mr. Weaver, as 1st Class Clerk, along with the late J. F. Jelf, R. Headland, and F. P. Hind. Mr. Weaver entered the Post Office as a Temporary Officer of the Secretariat in 1870, and three years later was transferred to the C.T.O., became Superintendent in 1886, eight years afterwards being incorporated in the Controller's new organisation, as already stated, and retired on reaching the age-limit in 1907.

Countries.—ARABIA.—King Ibn Saud, King of Hedjaz and Nejd, literally by the stroke of the pen with which he signed a recent contract with Marconi's Wireless Telegraph Co., Ltd., has assured direct communication with the whole world for the Arabian peninsula, within eighteen months from January of this year. No less than fifteen wireless stations have been contracted for; every important centre of his kingdom will be electrically linked, telegraphically at first, it is understood, subsequently telephonically. Four Marconi sets fitted in lorries are part of the contract. These are destined for mobile telegraph stations, and “to enable the king to keep in constant touch with his two capitals, Mecca and Riyadh, during his many journeys into the desert.”

In Mecca itself the very latest Marconi telegraph and telephone transmitters are to be installed, plus a very modern type of receiver, within the sacred precincts of this the Holy City, and within which sacred precincts no-one who is not of the Mahommedan faith is

permitted to enter. Thus only a Mohammedan engineer will be permitted to supervise the erection of the actual Meccan installations, though a British engineer is to supervise those outside. For the subsequent maintenance of the stations four of the king's subjects are at present attending a course of instruction in the Marconi School at Chelmsford, England.

As the stations in the smaller towns are to be worked by Arab operators, the controls will be adjusted to fixed wavelengths, and the mechanism so arranged that the mere turning of the relative switch to “receive” or “transmit” will automatically provide the set with the correct wavelength for the service required.

AUSTRALIA.—Mr. Lyons, Postmaster-General of the Australian Commonwealth, announced on Dec. 12 last that the Government had rejected the agreement concluded last year between Amalgamated Wireless (Australasia) Ltd., and Imperial and International Communications Ltd. He said it was the Cabinet's policy that the Government should control communications and the Post Office possessed the necessary equipment for handling overseas communication. A recent Senate statement, says *The Electrical Review*, reveals the fact that the Government have decided to erect four instead of five new A Class broadcasting stations. These are to be built at Rockhampton (Q), Newcastle (N.S.W.), Corowa (N.S.W.), and Crystal Brook (S.A.). The reduction, it is understood, is due to financial stringency. The new Commonwealth system of broadcasting was inaugurated by the Post Office on Dec. 22, when the Newcastle (N.S.W.) station staged a gala opening programme, which was successfully relayed to Sydney and Melbourne. The Newcastle station, which is equipped with a $2\frac{1}{2}$ kw. set, made in England by Standard Telephones & Cables Ltd., is one of a chain of twenty $2\frac{1}{2}$ -kw. stations which will work in conjunction with a smaller number of high-power stations.

CANADA.—The gross revenues of all telegraph, cable, and wireless systems operating in Canada during 1929 totalled \$16,526,441, an increase of over 10% on 1928. The number of telegrams transmitted between stations in Canada and between the United States and Canada amounted to 18,129,973, an increase of over a million. The new “carrier” telegraph facilities of the Canadian National Telegraphs are being extended, according to *The Times Engineering Supplement*. This new system, with provision for 12 channels, has been brought into operation between Montreal and Ottawa, and similar facilities are being provided between Montreal and Quebec. CHINA.—The *Chinese Economic Bulletin* states that preparations are well advanced for the construction of a large radio station for the broadcasting of news, speeches, and music. The Radio Administration of the Ministry of Communications has prepared a set of regulations, and all private owners of radio receivers will have to be registered. According to Reuter's Nanking agency the Chinese Telegraph Administration and the Commercial Pacific Cable Company have reached an agreement whereby the National Government has granted to the company the renewal of its landing licence in China for fourteen years as from Jan. 1, subject to certain revisions of the agreement. It is understood that the Ministry of Communications is to have an equal voice with the cable company in the relations of the Shanghai offices of the company (the only one in China) with the public, while the technical operation of the cables is to remain in the hands of the company. It is understood that the Great Northern Telegraph Company and the Eastern Extension Telegraph Company have signed somewhat similar agreements at Nanking after exceedingly protracted and delicate negotiations. DENMARK.—Though the number of licensed listeners in Denmark, 11 to 12% to the population, is considerable, the Danish Broadcasting Council is of the opinion that there is a large number of “pirate” listeners. In any case, according to *World-Radio*, after conferences between the Ministry of Public Works and the Ministry of Justice, the Council has received a promise of effective assistance from the police in the tracking of “pirates.” Each case of piracy will be considered individually, the fines varying from £2 5s. to £22 10s., with the addition in certain cases of the confiscation of the culprits' receiving sets.

GERMANY.—*The Exchange Telegraph*, Berlin Agency, announces that the Reich postal authorities have decided to make use of the power to take over the entire plant of the Transradio Co. for wireless overseas traffic on Jan. 1, 1932. The price to be paid will be 140% of the capital invested in 1921, which amounted to £825,000. The short-wave senders are not included in this price. The most important plant involved is the big transmitting station at Nauen. This decision of the Reich will prevent the proposed fusion of the Transradio Co. with the German Atlantic Telegraph Co. The Reichspostamt has also decided to proceed with the construction of nine high-powered broadcasting stations. Two are already in existence, i.e. Muhlacker and Heilsberg. Langenberg, in the Rhineland, will probably be the next—probably before next autumn. The remaining six stations will be situated at or near Breslau, Leipzig, Berlin, Hamburg, Munich, and Frankfurt Main. The new high-power stations will have an average aerial transmitting power of 60 kw. . . . The building of high-power stations in neighbouring countries is, in fact, says *The Times*, the principal reason given by the Reichspostamt for the entire scheme. GREAT BRITAIN.—The London daily press announces that as a sequel to a demonstration of a form of tele-cinema at the Physical and Optical Society's Exhibition, Baird Television Ltd. state that they have issued a writ against The Gramophone Company, Ltd., claiming infringement of a patent. Facsimile picture telegraph transmission is now available from Great Britain to Austria, Denmark, Germany, Sweden, and the United States. Similar facilities are also provided from Germany to America via London, the British Post Office handling the service to London, where the picturegrams are handed to the I. & I. Communications, Ltd. HUNGARY.—It is reported, says *The Electrical Review*, that two new 10-kw. relay broadcasting stations are to be opened shortly, and that a 100-kw. transmitter is contemplated for Budapest. According to *World-Radio*, the latter will not be ordered until towards the end of 1932. ICELAND.—As these lines go to press there is as yet no reliable news of the new broadcasting transmitter, the wavelength of which is to be 1,200 metres, and "is due to commence at any time now," so says *The Electrical Review*. The broadcasts will be for the most part in the country's own language, but English and German will occasionally be used. INDIA.—Broadcasting in India seems to hang fire and the Indian correspondent of our contemporary just named above reports that broadcasting service prizes were offered some time ago for constructive essays on the subject. The P.M.G. of Bombay acted as examiner, and the best essay selected by him was written by a Mr. S. R. Bellimal, who considers that the progress of broadcasting in India depends to a large degree on the cheapness of reception. Mr. Bellimal makes some very useful suggestions which should prove helpful towards the goal of reduction of costs to the listener. *The Times* announced that a proposal to provide three new powerful inland stations, in addition to those existing at Bombay and Calcutta, was to be considered by the Broadcasting Advisory Committee on Dec. 20. IRISH FREE STATE.—It is now officially confirmed that the new high-power transmitter is to be built at Athlone. The studio will remain in Dublin. MOROCCO.—A five-year concession has been granted recently to the Compania Hispano-Radio-Maritima for the installation of a wireless telegraph and telephone service in Arzila, in the Spanish zone of Morocco. The power of station, 250 watts, wavelength 150 to 160 metres. The communication is especially desired for messages to and from fishing craft off the Western coast.

NEW ZEALAND.—The existing contract with the Radio Broadcasting Co. of New Zealand expires in January next year, and from that date it is proposed that the Post and Telegraph Department shall assume control of the technical side of the service, but that of the programme will be left largely in other hands, says *World-Radio*. This and the many necessary details have yet to be worked out before the matter can be placed before Parliament for ratification. NORWAY.—The Norwegian Telegraph authorities have decided to replace the following overhead telephone and telegraph lines by underground cables:—Oslo-Stavanger; Oslo-Bergen, with a branch from Honefoss to Cjovik; Oslo-Nidarso,

with a branch between Domass and Andalsnes; and Oslo-Halden. PERSIA.—As the result of the Persian Government's claim that concession extension has not been ratified, the Indo-European Telegraph Co. and the Indo-European Telegraph Department have notified the Government that they intend to relinquish all their lines in Persia at the end of the present month. RUSSIA.—It is reported that a station of 100-kw. capacity has been completed at Kolpino, near Leningrad. Another station on the same lines is being constructed in Siberia. This would appear to be confirmed by a *Times* paragraph which, quoting from the official *Izvestia* a week or two ago, stated that "the finishing touches were being given to" this particular new station, one of the eleven 100-kilowatt stations included in the Five-Year Plan. SWITZERLAND.—*The Electrical Review* learns from its Zurich correspondent that the construction of the new wireless transmitters at Sottens and Munster is rapidly proceeding. It is further understood that they will actually be in operation some time during the present month. TASMANIA.—*A preference for wireless!*—Giving evidence before the Federal Public Works Committee, which is investigating the best way of providing telephone service between the mainland and Tasmania, Mr. Frank Edwards, of the Sydney Chamber of Manufacturers, said he favoured *wireless* telephony rather than *cable* telephony because 80% of the wireless apparatus could be manufactured in Australia, whereas the whole of the cable would have to be imported. It was not stated by which country the cable would in all probability be manufactured. U.S.A.—A tiny shack on Long Island, the first commercial wireless station built in America by Signor Marconi, is to be preserved as an historical exhibit. It has been taken to Rock Point, Long Island, where it stands beneath the great towers of the modern wireless station there. VENEZUELA.—It is reported in the technical press that the American company which recently took over the French Cable Company in Venezuela is laying a new connecting submarine cable between La Guaira, Curaçao, Aruba, Maracaibo, Baranquilla, and Bonaire. YUGO-SLAVIA.—Radio-Belgrade, the capital's broadcasting station, has 30,000 listeners. Hitherto only 60% of the licence money was received by the broadcasting authorities. The Post Office retained the remaining 40% as a tax. In future, Radio-Belgrade will receive 65% of the fees; Zagreb, owing to the smaller number of listeners, will receive 70%, and Ljubljana (the smallest region) is to receive 80%. *World-Radio* informs us that during the present year it is hoped to erect one relay station at Subotica, near the Hungarian borders, and another at Skoplje in Southern Serbia. Belgrade's power will also be increased accordingly.

Success in Literature.—It is the knowledge of what to leave in the ink-bottle that makes for success in literature!—Adam Gordon. J. J. T.

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

THE following question in Telephony is set for solution by our readers. A prize of a book will be awarded for the best answer which should reach the Editor by Feb. 28. The correct solution will appear in the April issue.

Describe the mechanical and electrical processes involved in a subscriber's telephone circuit—

- (a) in the conversion of sound waves into alternating current; and
- (b) in the conversion of alternating current into sound waves.

LONG DISTANCE TELEPHONY.

J. F. DARBY (*Headquarters Traffic Section*).

(III.)

THE last article dealt mainly with trunk operating on a no-delay basis. This subject can be dismissed, for the time being, after reference has been made to one more important feature—one likely to play an important part in the future working on 'delay' routes—viz., *alternative routing*. When circuits are operated on a no-delay basis alternative routings may be used for attempting to complete connexions; these are indicated on charts supplied to each exchange, primary and secondary routes being given; alternative routes other than those shown on the charts may be used, at the discretion of the supervising staff, when it is known that transmission difficulties will not be involved and providing that traffic is not diverted to routes working on a delay basis. The use of such routings enables greater circuit efficiency (an increase in the ratio of occupied to unoccupied circuit time) to be obtained from the trunk lines available and materially helps in providing service without delay.

System of Operating.—(II) Trunk Operating on a 'Demand' (Special Control) Basis.—This system is applicable to routes provided on a 'delay' basis, but embraces certain features of both no-delay and full delay operating. The trunk traffic is handled at A positions when the traffic is light enough to admit of a no delay service being given and on special positions (called *special control* positions), when the volume traffic is such as to cause sustained delay.

The system of special control is applicable on trunk circuits when (a) direct record working is not in force at the exchange in which the circuits terminate, and (b) the trunk circuits in question are equipped for *automatic* signalling. The term 'direct record working' applies to the system of booking demands for trunk service under which subscribers in a prescribed area are instructed to ask for 'Trunks' (dial 94 in the case of non-director automatic areas, TRU in director automatic areas). An A operator receiving such a demand connects the subscriber with a record junction which terminates at the incoming end on a record table (in the case of London, connexions are made via an intermediate—record distribution—position) equipped with facilities for recording demands. No provision is made at these positions either as regards cord circuits or trunk multiple for the completion of calls.

Direct record working is only adopted in the larger centres (the reasons will be given later under trunk signalling working) and it follows, therefore, that the special control system is in force at the smaller exchanges and on the shorter trunk routes, having regard to the signalling limitations of the longer circuits.

An important exception to the foregoing was made in 1929 when an experiment was carried out in the London zone extending the system of special control beyond the limits mentioned above, i.e., it was adopted in an area with direct recording in force and on non-automatic (generator) signalling routes. The first step taken was to provide for a multiple of the circuits in question to be available over the record positions. This was arranged by requiring subscribers to ask for 'Toll' instead of 'Trunk' (or dial TOL instead of TRU), the record positions in the Toll Exchange being equipped with outgoing multiple, whereas the Trunk record positions were not so equipped.

As mentioned in article (I) of December, 1930, the arrangement proved to be very satisfactory; certain aspects, however, called for further investigation, as, for example, the question of signalling. When a subscriber on a manual exchange is switched to a Toll 'recording and completing' position, the connexion is set up, at the A position of the local exchange, by means of a non-through signalling cord circuit (the standard cord circuit for A positions, so arranged that signals from the calling subscriber's switchhook do not pass beyond the A position) with the result that the

controlling operator at the Toll position does not receive a clear or recall signal on her answering cord from the calling subscriber. She must, therefore, depend, at the end of a call, on the clear of the *called* subscriber, and this signal is received only if the trunk circuit in use is equipped for automatic signalling. In this particular case, generator signalling trunk circuits were included in the scheme and it follows, therefore, that on many calls set up on a no-delay basis, no supervisory signal is received from either calling or called subscriber.

Another point which arises in giving a service which involves controlling a call at a point remote from the originating A position and at the same time not releasing the calling subscriber (also when automatic subscribers dial a manual board operator and are held at the telephone during the completion of a call) is that the controlling operator has no immediate check to bring to light an error in the record of the exchange number of the calling subscriber required for accounting and operating purposes; an error which may mean loss of revenue or other difficulties. Other matters requiring attention in connexion with this extension of special control working relate to transmission (the quality and strength of speech) and 'routing' (the selection of the correct routes for the circulation of calls) and arise mainly from the complications which result from operating long distance circuits with a common team of operators. These points will be covered when reviewing the question of the modification in hand for providing a trunk service on demand.

Trunk circuits worked on a special control basis are, as far as bothway and outgoing lines are concerned, multiplied over the A positions and the special control positions. In addition, the circuits are terminated, individually, on strips of calling and answering jacks on the special control positions, and are distributed on the basis of three or four trunk circuits per special control position. The incoming ends of the circuits are normally terminated on B positions, with facilities for switching the ends of bothway circuits to special control positions for operating when delay working is in force.

Demands for trunk connexions are recorded, in all cases, by the A operators, and when delay working is not in force calls are set up and controlled in the same manner as no-delay timed calls; the normal automatic signalling facilities are given. Delay working is introduced when demands for a certain route exceed its carrying capacity for no-delay working, i.e., when all A operators are experiencing difficulty due to circuits being engaged and uncompleted demands are accumulating. The supervisor in charge decides the point at which a route shall be put under 'special control.' At this stage a yellow peg is inserted in the outgoing multiple as an indication to the A operators that demands must be recorded and the subscribers released. The ticket record is then passed to the appropriate special control position for completion in booking code turn with other waiting calls. The method of working at special control positions is similar to that at automatic signalling trunk positions (to be dealt with later).

The principle of special control working, extended as in the case of the London zone and much more so in the case of the 'combined line and recording' method in America, is, without doubt, capable of general application to the British telephone service and plans are in hand to attain this end. As the system provides a service, as far as possible on demand, while a subscriber remains at the telephone, the expression 'Demand System' has been adopted in Great Britain for this elaboration of the special control method.

Systems of Operating.—(III) Trunk Operating on a Delay (Trunk Signalling) Basis.—This system is the normal method of working on 'delay' routes where special control working is not applicable, i.e., on circuits not equipped for automatic signalling and circuits terminated in exchanges where direct record working is in force. (Trunk signalling working is, therefore, adopted on *automatic* signalling routes when direct record working is in force.) Direct recording and trunk signalling working are inseparable and, generally speaking, are in force on the main long distance routes.

Direct record working is introduced mainly in large cities where a number of local exchanges are served by one trunk exchange—the system simplifies the work of the local exchange A operators who perform a simple switching operation of connecting a subscriber with a record position. In the case of automatic areas, subscribers are able to dial 'trunk records' direct. The alternative to direct record working is for all demands for trunk service to be recorded on tickets by A operators; if the trunk signalling circuits are not terminated in the same exchange as that in which the A operator records the calls, the details on the ticket are passed by telephone to the controlling exchange and the call is recorded again—the first ticket being cancelled. This alternative method of recording is, therefore, more involved from an operating point of view but it is definitely advantageous from the subscribers' standpoint, since direct recording places upon subscribers the onus of making a distinction when booking various classes of calls. The recording of all long-distance demands by A operators is favoured in America, the policy being to require subscribers to undertake as little discrimination as possible in passing demands. It seems, however, likely that in Great Britain, in connexion with the modifications in hand for substituting the Demand System for delay working, that direct recording will be adopted more generally in order to simplify the working of the system, at any rate for the time being.

Circuits operated on a trunk signalling basis are distributed, for operating purposes, over trunk signalling positions, and terminated on the basis of from one to four circuits per position, according to the importance of the circuits. In the case of trunk circuits used for routing *direct* traffic (i.e., traffic passing over one 'delay' route only) in one direction only, the incoming ends of such circuits are usually terminated on B positions having direct access to the local network; otherwise the circuits are terminated, at both ends, on trunk signalling positions. Each trunk operator has, therefore, exclusive access to certain circuits only (apart from concentration conditions, for which a multiple or partial multiple is provided) and an indication is given on each trunk signalling position of the distant exchange or exchanges served.

The basis of allocation of circuits is as follows:—

Four trunk circuits per position—routes of 80 miles or less.	
Three „ „ „ „	—routes of over 80 miles and under 200 miles.
Two „ „ „ „	—routes of 200 miles and Anglo-Continental circuits except in the following case.
One „ „ „ „	—Continental circuits where only one circuit serving a Continental country exists.

Radio-telephone channels are arranged on the basis of one channel per two positions.

The reason for the above grading is, obviously, the relative costs of operating as compared with circuit costs; as the latter increase—through distance or the use of sea cable or radio links—the more it becomes desirable to obtain the highest output per circuit and this is achieved by providing more operating time per call. In practice the amount of chargeable conversational time per hour per channel varies from 30 minutes for the shorter routes up to as much as 50 minutes for the longer channels.

If the circuits composing a group to a distant exchange do not exceed six in number (five in the case of groups of 80 miles or less) they are arranged on a both-way basis, i.e., each circuit is equipped for working in either direction. If the number of circuits exceeds six, three groups are formed, one to carry *direct* outgoing traffic, one to carry *direct* incoming traffic and a third group of both-way circuits to carry *indirect* traffic (traffic circulating over two or more 'delay' routes) and to provide a margin for equalising delays.

It has already been mentioned that, at recording positions, facilities are not normally provided for completing connexions and the procedure followed is to release the calling subscriber, informing him that he will be rung later and to pass the ticket

record by pneumatic tube or by hand to the appropriate trunk signalling position.

At this position the tickets are lined up in accordance with booking time and disposed of by one of the following three methods of working. (Under the Demand System of working these methods have to be resorted to in times of pressure and on 'suspended' calls).

- (a) *Ordinary*.—The controlling trunk operator plugs into a disengaged circuit and signals the distant trunk operator. Upon hearing the latter's salutation she passes particulars of the *called* subscriber's number. While waiting for the latter to be connected, the *calling* subscriber is obtained on the answering cord (i) via a local trunk junction (circuit between the trunk exchange multiple and the local exchange of the calling subscriber), (ii) direct in the subscribers' multiple (in the case of combined trunk and local exchanges) or (iii) over a trunk and junction circuit. The *ordinary* method of operating is adopted on circuits up to approximately 80 miles in length and on unidirectional circuits earmarked for direct traffic, unless the direct dialling method is applicable.
- (b) *Direct Dialling*.—The trunk operator plugs into a disengaged circuit and dials the distant subscriber and then obtains the calling subscriber as indicated under (a). This method is applicable when the distant exchange is automatic and dialling is practicable over the route in question.
- (c) *Special Attention*.—This method differs from (a) in that the operators at both ends keep an operating cord continuously connected with the circuit (the circuit is terminated at each end on a trunk signalling position). It is not necessary, therefore, for any signalling to take place, as both operators supervise closely and are ready to go into circuit at the termination of any call. Calls are passed in advance of the time of maturation so that the attention of the required subscribers may be gained immediately it appears likely that a trunk circuit will become available. In practice, in addition to calls actually set up, two waiting calls (irrespective of suspended transactions) are always on hand and, as a call finishes, another waiting call is passed.

As soon as it seems likely that a trunk circuit will be available for another conversation, the attention of the subscriber required for the first waiting call is obtained. As far as possible, the subscriber is not brought to his telephone more than one minute in advance of the time when the connexion can be set up. This method is adopted on circuits worked not more than three per position on a both-way basis—generally the longer distance routes.

The method of operating *inter-continental* calls over radio channels is basically 'special attention.' (The general term 'trunk signalling' is actually not applicable, as no signalling facilities between the traffic operators at London and the distant *têtes de ligne* are at present available, although they may be expected in the near future. Between the New York and Buenos Aires trunk positions, signalling is at present in force.)

The two operators working a radio channel are employed, one on the control of the radio channel itself, giving continuous monitoring thereon and responsible for obtaining the distant subscriber in America, Australia, &c., and the other, designated the 'advance caller' (where necessary, with foreign language qualifications), who is responsible for obtaining the subscriber in Great Britain or the Continent.

Two methods of signalling are in force (a) automatic and (b) generator. In the case of (a), the conditions given for automatic

signalling under no-delay working are applicable, so far as signalling and supervision of the trunk circuits are concerned—one of the main features, it will be recalled, being 'through supervision,' i.e., the switch-hook (answering and clearing) signals from the called subscriber are received on the supervisory lamp of the controlling operator's calling cord. As regards the supervisory signal on the controlling operator's answering cord, the conditions which obtain depend upon the nature of the connexion made to the calling subscriber. If the call is reversed to the calling subscriber direct in the subscriber's multiple, over a trunk junction or automatic signalling trunk circuit, the controlling trunk operator receives the switch-hook signals from the calling subscriber on the supervisory lamp of her answering cord.

The more general condition, on automatic signalling routes, is for the supervisory signals to be received on both the answering and calling cords on the controlling operator's position, a 'clear' from both subscribers being received—a most desirable condition from the point of view of supervision.

In the case of generator signalling routes, the calling and clearing signals at the distant end of a trunk circuit are actuated by a generator current, sent from the outgoing end by the operation of a ringing key. Further, the switch-hook signals (including the clearing signal) from the subscriber at the distant end of the trunk circuit are not received on the supervisory lamp of the controlling operator's calling cord. The conditions on the answering cord are the same as those mentioned above for automatic trunk signalling. It follows, therefore, that on generator signalling routes, in some cases one clearing signal—that of the *calling* subscriber—is received by the controlling operator and, in other cases, no signal is received at all. The latter has been termed 'blind supervision' and such a condition is not infrequent on the longer distance routes, particularly where the controlling exchange is very remote from the originating exchange. For example, in a call from Southampton to Berlin, controlled in London, no supervisory signal is received on either cord in London. There is considerable merit from the point of view of supervision in the control of a call being assigned to an exchange as near as possible to the originating exchange, in order that automatic signalling may be obtained from the calling subscriber and a clearing signal given to the controlling operator. ('Local' control also has the merit of providing easy access from the caller to the controlling operator in cases of difficulties and enquiries.) In the case of international calls, owing to language difficulties it is unlikely that control can be vested at any point other than the International *tête de ligne*—London. In connexion with long distance key sending, at present being developed, it is probable that voice frequency signalling will be provided, which will enable the 'switch-hook' signals from the calling and called subscribers to be received by the controlling telephonist. Experiments were carried out in 1930 under which subscribers in London were 'keyed' direct from Brussels and 'switch-hook' signals were given to the Brussels trunk operator indicating the removal and replacement of the receiver of the called subscriber in London.

(To be continued.)

ERRATA. (January issue.)

After the final proof of the last instalment of this article had been corrected and passed for press three lines in two different columns were accidentally dropped in the process of making up by the printers.

P. 77 (right-hand column), line 18, *et seq.*, should read—

- (b) The supervisory signal associated with the calling cord at the originating exchange is displayed until the operator at the distant B position enters the circuit, when it is again restored to normal.

P. 78 (left-hand column), the last 3 lines from the bottom should read—

"been completely keyed. At the originating exchange the supervisory signal on the A operator's calling cord is displayed until connexion is made with the

HOW TO IMPROVE THE TELEPHONE SERVICE.

DISCUSSION HELD BY THE TELEPHONE & TELEGRAPH SOCIETY OF LONDON.

Mr. M. C. PINK (Deputy-Controller, London Telephone Service) opened the discussion with the following observations:—

A week or two ago, I had the interesting experience of listening for over ½-hour to a titled lady stating, in a conversation interspersed with adjectives of an explosive type, what *she* thought of the London Telephone Service. In contrast with this experience I might perhaps quote the remark of a Post Office friend who, on hearing the title of this discussion, said "Why paint the lily?" I should not like to raise blushes on the face of our Chairman by emphasising the latter view in opposition to the view of the well-intentioned lady, but I think we can probably all agree that the measure of efficiency of the Telephone Service really lies between these two extremes. My main task this evening is to open up the field for the discussion of how the service can be improved.

There is nothing static about telephone problems. Rapid progress is being made in those branches of physical science which react on electrical communication systems and the telephone art itself is in a constant state of flux. As a result methods have frequently to be revised to meet new conditions. You probably saw in the papers recently a reference to the Princess's Port. At one stage during the last century, one of the princesses was ordered to take a glass of port every morning. An order was given for a fresh bottle of port to be opened each day. This order was not countermanded, and for decades after the princess had grown to womanhood, the princess's port was still being solemnly opened each morning. There is sometimes a tendency in the direction of the princess's port in the Telephone Service. Methods designed for one set of conditions may remain unaltered when the conditions themselves have changed. There is room for constant vigilance in this matter, and much of that vigilance has to be exercised by officers who are actively supervising work in the field. In this connexion, however, it may be claimed that an allowance of time for special investigation may produce better results than the combined efforts of individuals who are tied up with their day to day responsibilities. The proper organisation of this work of special investigation is a justification for the establishment of a segregated group of development and research officers. This principle has been followed on the engineering side with good results, but I think the wider application of study and research in connexion with other aspects of the Telephone Service would lead to an improvement in efficiency. In an Egyptian papyrus, 5,000 years old, we may read "Beware of producing crude thoughts. Study till thy words are matured."

Adequate statistics are essential in connexion with any investigation of possibilities of improvement. It is well to bear in mind the trite definition "Science is Measurement." If we are going to deal scientifically with the various problems that face us, we must know the measure of our strength or weakness in any direction. Measurements must be taken in any necessary detail, but the results must be sifted and rendered available in a compressed form for study. In this connexion, graphic methods of presentation are extremely valuable as they indicate so clearly not only existing conditions but tendencies, and I think they could be more widely applied. The forecasts derived from such graphic statistics may have a considerable influence in determining the steps to be taken in any given direction.

The Telephone Service is pre-eminently a personal one. The consumer is in direct touch with the supplier. Calls cannot as a rule be made by deputy and there is no middle man to act as intermediary or retailer who, with unctuous servility, can persuade the consumer that a bad article is beyond criticism. In such a service as ours, the need for good personal relations is fundamental.

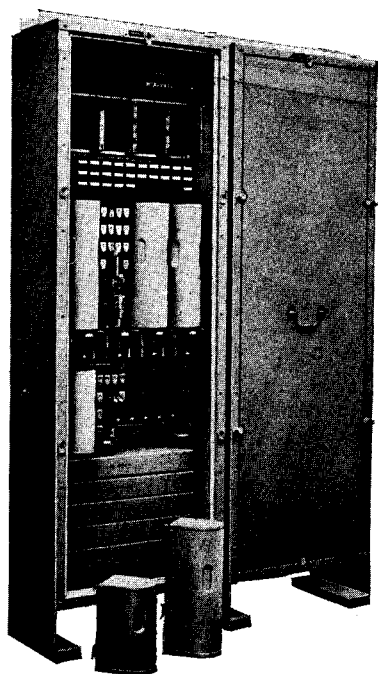
Complete mutual understanding can only be achieved if both parties are ready to act in a spirit of co-operation. Friendly reactions between the supplier and the user must inevitably lead to smooth working.

There is therefore a primary and insistent need for the cultivation of good relations at every point at which the telephone touches the public. Public opinion must be so developed that telephone service will, in the public mind, be synonymous with assistance and courtesy. Without such cultivation there is always the danger that the mention of the Telephone Service may act as the proverbial red rag to a bull.

In making a review of the progress of improvement in our relations with the public and in our consideration of possible means of improving the service, we must keep in mind the fact that service improvement is an evolutionary process, which is continually in operation. There is, and can be, no finality. Changes are constantly being made. Some of these can be introduced without material delay. In some cases, however, a considerable period must be allowed for the physical application of a policy before the effect of decisions already taken can be felt.

At this stage it may be helpful if I mention the principal points of contact with the public and then state in connexion with each point some theoretical possibilities of improvement and some of the changes which are at present in process of maturation—so far as it is possible to do this in the time at my disposal. The review must inevitably be incomplete, and this will have the advantage of enabling those who follow to add to the interest of the discussion by filling in some of the gaps.

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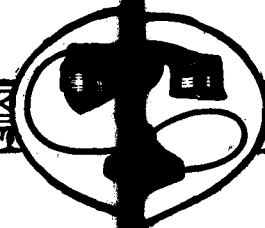
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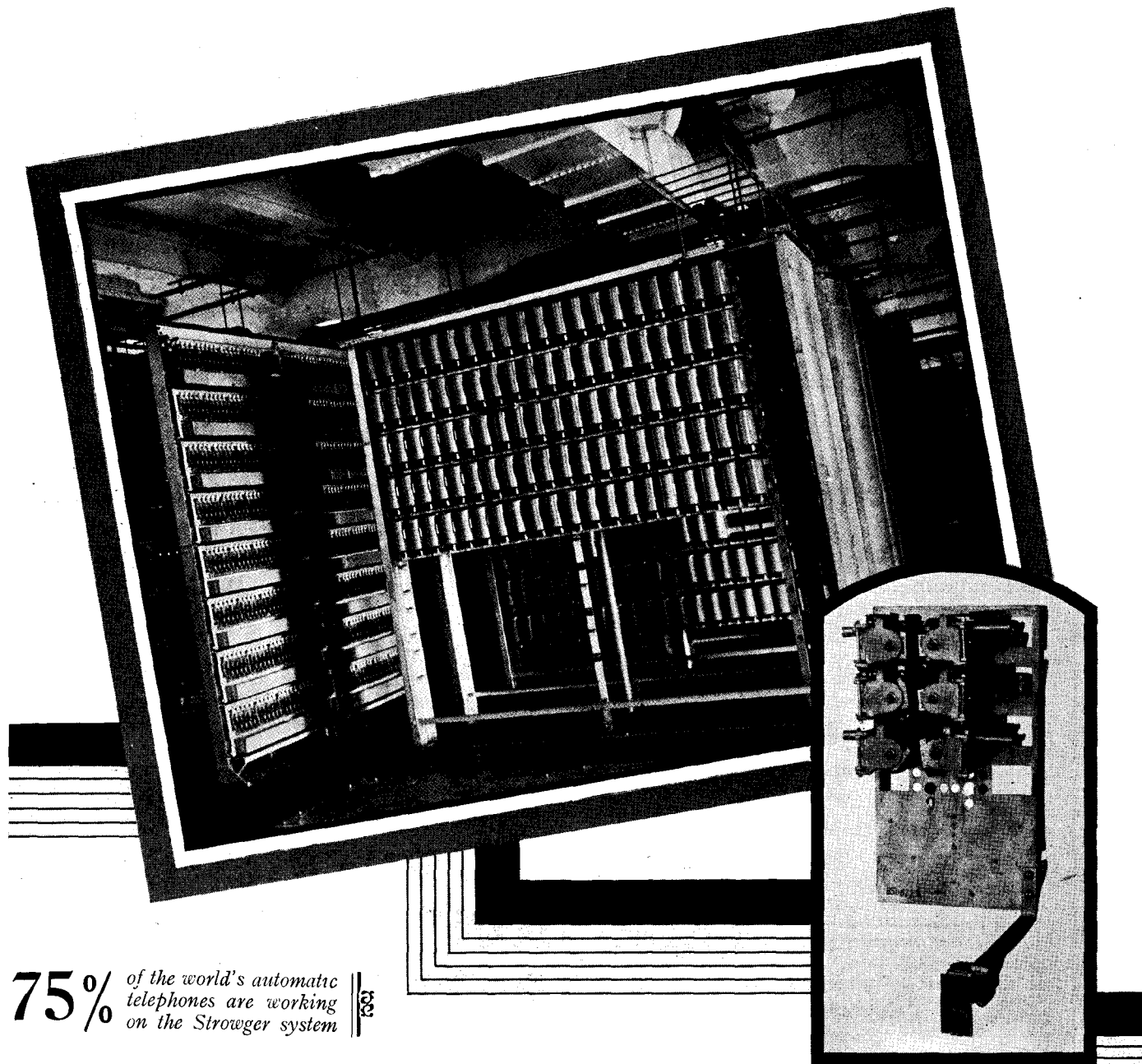
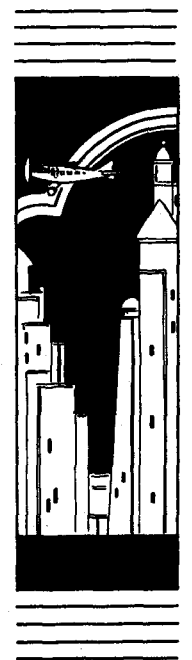


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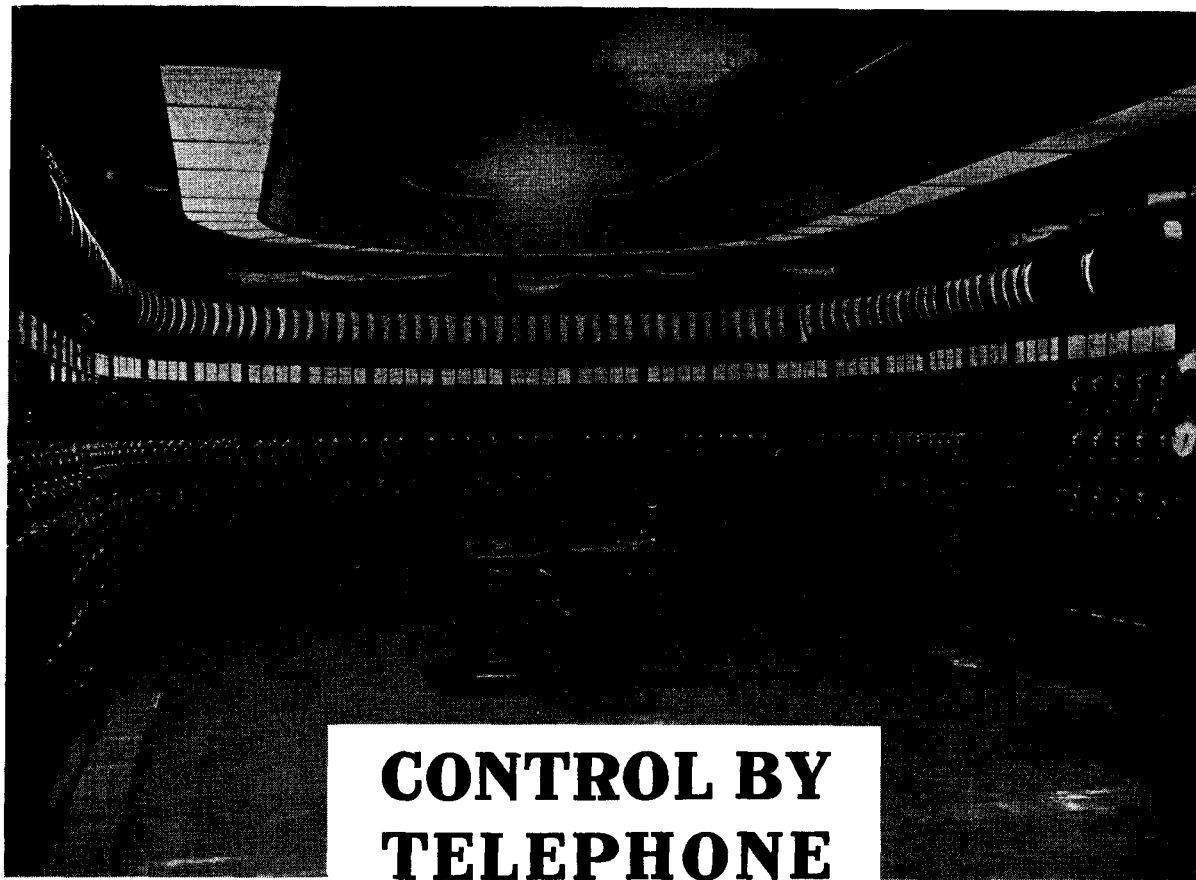
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CONTROL BY TELEPHONE

From his Control Room, the operator must be in constant touch with all the sub-stations under his charge. Reliability must be the keynote of the equipment used in this control, for upon it may rest the difference between profit and loss, movement and stagnation. Positive control by telephone assures the most reliable and effective system of communication between control room and sub-stations.

The photograph reproduced above shows the Power Control Room of the London Electric Railways at Lots Road. The special desk in the centre (which is also shown below in greater detail) was recently manufactured and installed by Standard Telephones and Cables Ltd., and enables the control engineer to get readily into telephonic communication with any of the sub-stations on the London Underground Railway system.

"Standard" equipment is thus helping in the control of the power supply for London's premier traffic concern—yet another tribute to its reliability in service.

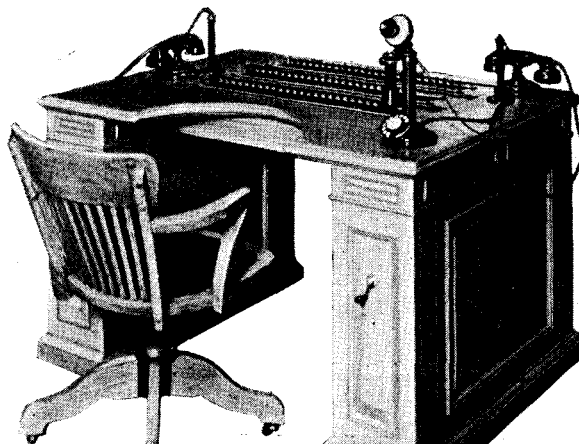
Standard Telephones and Cables Limited

COLUMBIA HOUSE, ALDWYCH, LONDON, W.C.2

Telephone: Holborn 8765 (24 lines)

Works: HENDON, NORTH WOOLWICH, NEW SOUTHGATE

Branches: BIRMINGHAM, GLASGOW, LEEDS, MANCHESTER AND DUBLIN



The point of public contact which I will take first is *provision of service*. I think there is no doubt whatever that the public as a whole has not yet conceived what the Telephone Service is and what it is capable of doing for them. The service is bound to benefit from a wider knowledge on the part of the public of its activities. There are various ways of widening this knowledge. In this connexion I think there is scope for the better education of our representatives who are doing contract and fitting work and for widening the advertising field. A good deal is already being done in both these directions, but the public *must* be induced to become more "telephone minded."

The problems of canvassing are being more closely examined than ever before. Better recruits are entering the canvassing grades. The achievements of individual men and of groups of men under a particular supervising officer are being analysed and studied, and detailed forecasts of achievement should permit a more scientific application of checks and stimuli for the purpose of increasing the rate of expansion of the system.

The advertising process is being materially extended by the distribution of advertising matter by post and in other ways, and I am hoping that before long the introduction of a series of poster displays will help to stimulate public interest in the service.

A lot of good sales work is done in certain other telephone administrations by employees who are not normally engaged in contract work. Where a full understanding, coupled with the right spirit, exists the telephone employees will take a pride in calling attention to cases in which in their judgment there is a chance of obtaining a new telephone subscriber or of improving a subscriber's existing facilities. If more interest could be stimulated in this direction among our own people, I am sure it would result in an improvement in service.

In many cases people hesitate before ordering a telephone circuit; but when they have once decided to order, it is surprising to find how important its provision becomes in their eyes! There is probably nothing which sends up the barometer of public esteem so rapidly as the prompt provision of service. A good deal has already been done in the examination of the question and in the provision of ways and means for speeding up the work of connecting subscribers.

Any improvement in the means of ascertaining more intimately and definitely what the members of the public want in the way of telephone service when they are once connected would be welcome.

It is true that there are occasional indications in the Press, and in written communications to the Department, of developments which would be convenient to individual subscribers. We have also the benefit of opinions expressed from time to time by the Chambers of Commerce and by the Advisory Committees. It is rather remarkable that these bodies do not produce more suggestions for consideration, but this is perhaps an indirect tribute to the extent to which the Department is anticipating public demand in its development of the service. There are, however, other bodies which speak on behalf of the public, and they are more prolific in suggestions for the improvement of the Telephone Service. Mention of a certain "stranglehold" reminds us that one view put forward is that a drastic remodelling of schemes of control and organisation is essential. The discussion of this aspect of the question of improvement would probably take more than one evening in itself, and my suggestion (Mr. Chairman) is that in our discussion this evening it might be desirable to limit our considerations to the means of improving the service under the existing system of control.

Possibly the indications of the requirements expressed by subscribers in connexion with the improvement of service can be summed up as follows:—

Chéapen the service.

Improve in some measure the amount of assistance given to subscribers.

Speed up long distance communication.

On the tariff question, it is unlikely that any material change can be even considered until we have proceeded further with conversion to automatic working. It may, however, be possible to find ways of expressing the tariff in simpler form, and by this means simplifying accounting methods.

Before dealing with the question of the long distance services, I would like to continue the review of the local service and to consider directions in which improvements might be made in the day-to-day running of the service—the point at which contact with the public is most vital.

Our service is essentially a technical one. The fundamental responsibility is the establishment of efficient communication, and all the other activities only arise as the result of this fundamental work. It is clear that improvement in the operation of any steps required in the act of setting up any type of communication will improve the Telephone Service as a whole. Moreover, if any particular step in the task of setting up a call can be achieved by cheaper methods without sacrifice of efficiency, the problem of a reduction in capital charges, and possibly maintenance charges, is simplified and the change may re-act favourably on tariffs.

I will mention briefly some of the more outstanding changes for which preparation is being made in connexion with the *handling of the traffic*.

The elimination of order-wire working is of outstanding importance. Under the present system, order circuits are used on many routes in addition to the junctions provided for speech. The use of such circuits has certain operating disadvantages. A new system of straightforward junction working is being developed. Under this system the calling operator will herself select the circuit to be used for a subscriber's call and will give her order over that

circuit to the objective exchange. The receiving operator will be automatically connected to each calling circuit in turn. This change should improve the transmission efficiency for service purposes and also lead in other ways to a reduction of errors.

Another important change will be the elimination, in many cases, of the operator at an automatic exchange who at present receives and connects incoming demands from manual exchanges. At many of the manual exchanges keys will be provided by means of which the "A" operators can pass calls direct to and through the switching mechanism at automatic exchanges without the intervention of another manual operator. The introduction of this system should tend to reduce the probability of error, and so to improve the service. Moreover the provision of keys of this type at "A" positions will permit the introduction of improved and more economical routing facilities through intermediate switching centres.

In the existing switching systems some of the apparatus used in conjunction with the individual switches is only required for a very short time, while a call is being set up, and remains idle throughout the conversation period. The question of making better use of plant of this type by detaching it from individual switches, and providing for the automatic association of the plant with a number of switches in succession, has received a considerable amount of attention, and modifications in this direction are being actively pursued.

By the use of an adaptation of the talking film, it is now possible to provide for the efficient conversion of mechanical signals into the sound of human speech. The use of such a device in place of some of our "tones" would be feasible and might possibly be an improvement.

Turning now to the long distance service, I think there is no doubt whatever that the effect of decisions already given in connexion with the development of the long distance system of the country will be far reaching. Long distance service provides an excellent example of the application of the evolutionary processes. Up to 9 years ago, practically all calls between the London area and places outside that area were subject to some delay. A calling subscriber could not be connected on demand. Even if the circuit over which he wished to be connected were available at the moment when his call was passed, it was necessary for him to clear his line and then to be rung incoming before his call could be connected.

In 1921 an addition to the Trunk system was brought into service in the form of a new exchange in which the trunk lines were multiplied in front of each operator and the recording circuits were connected to the line operating positions. As a result it was possible to effect on demand the calls that came to this new section of the Trunk system; and in order to facilitate the circulation of the calls to the appropriate section of the Trunk system the new exchange was called "Toll." The "on demand" facility found great favour with the public, and at the present time about 81% of the calls between the London area and provincial exchanges outside that area are connected on demand.

It has now been decided to reorganise the remainder of the Trunk system in order to provide the maximum amount of on-demand service, and this decision involves an entire change in the design of the main Trunk exchange. The modifications will naturally take some considerable time to mature, but they must inevitably lead to a very marked improvement in the telephone service.

The next point of public contact arises from the necessity for *payment for service rendered*.

In reviewing the possible lines of improvement in connexion with the payment for service, it is essential to bear in mind the far-reaching effects of a lack of confidence in the departmental records. In this connexion may I read you a paragraph from a letter which appeared recently in the *Daily Telegraph*:—

"May I say that it is wrong to blame either the operator or the engineers for the perpetual friction engendered by the Post Office with its clients. The people responsible are the members of the Accounts Department who for some reason suppose that they are entitled to hold the public to ransom, to mulct them in fines, and to withhold and alter accounts to suit their bureaucratic convenience."

This, of course, is very sweeping, and I hope it makes our accounting colleagues tremble in their shoes. It will, perhaps, induce some of them to take an active part in this discussion and let us know what steps they could recommend to correct the views of the gentleman whose words I have quoted.

Whether we like it or not, there are many people who regard the departmental accounts with distrust, and I think there is no doubt that the more we can convince the public that our records are reliable the better will be their attitude towards the Telephone Service itself, with a consequent reaction on general efficiency.

One aim of the department should be to see that the system adopted for account payment is that which appeals most widely to the public and achieves the maximum of telephone development. It has been suggested from time to time that both these objects would be achieved by the introduction of monthly payments. I think the question of whether such monthly payments would improve the telephone service is a subject which might very well be discussed.

There is no doubt that a prompt application of the power to disconnect for non-payment has led to some trouble and a vast amount of criticism.

People are now allowed a little more rope before the power of disconnection is exercised, and this should lead to an improvement in public relations, with beneficial result on the service.

From the public point of view the responsibility of all branches of the service is a single responsibility, and theoretically, anyone dealing with the public, whether it be on engineering, accounts, traffic, or any other matter, should operate on a code of public relations which is precisely similar to that which guides a person in any other branch. It is obvious that harmony in public relations can only be obtained by a complete co-ordination of all the functions of the service. This implies that the first necessity is the further development of the spirit of co-operation within the service and the fullest understanding of one another's functions all the way down the line. Co-operation must be based on confidence, and that confidence has to be cultivated by making the fullest use of the abilities and efforts of others with a wide understanding of their point of view.

A perfect machine has all parts functionalised, co-ordinated, and controlled by one source of power. The source of power in a telephone mechanism may be an actual centralised personality or it may be an ideal or hypothetical condition built up on the basis of mutual understanding by the men and women who give their contributions for one end—service efficiency and service improvement. There may be differences of opinion as to whether this or that work should be done by this or the other branch of the department, or whether the work in one department should be done at certain times by either men or women; but if in considering each and all these problems the guiding principle is the ideal of service, and if in working to this objective personal idiosyncrasies and antagonisms are sunk, the inevitable result will be improvement of service.

In working towards this ideal condition of internal relations, some of the outstanding requirements may be briefly summarised as:—

Fuller education of youth.

Fuller understanding of the other man's job and his point of view.

Full explanation of and a wide dissemination of information regarding the common objective.

Further development of the appreciation that suggestions are welcomed.

I think I have established that there is no aspect of the Service in which there is not room for constructive criticism and suggestion. All the changes to which I have referred will have their effect on service improvement, and to-night we have an opportunity for formulating further suggestions which can be considered in relation to the problem as a whole.

In the ensuing discussion which was of an informal and "domestic" character, the following took part: Messrs. B. O. Anson, Young, F. B. Nicholls, J. W. Nicholls, Bartholomew, Kemp, Morgan, Williams, Highet, Lee, Beall, and Millar.

GUILDFORD TELEPHONE NOTES.

MR. T. W. CAPENHURST, Traffic Superintendent, retired at the close of 1930. The staff of the district expressed their good wishes in the form of an armchair, which was presented by the District Manager, Mr. R. V. Tucker, during the course of a small but very enjoyable social gathering held in the Traffic Office (temporarily unrecognisable as such) on the evening of Jan. 5.

After Mr. Tucker had expressed his appreciation of Mr. Capenhurst's abilities, the latter replied with a brief account of the changes which had taken place during his seven years at Guildford. Mr. Capenhurst has not moved very far away, so we shall doubtless hear of him from time to time.

We welcome our erstwhile neighbour, Mr. H. C. France, who has come to take charge of the Traffic Department, and trust that his stay with us will be to our mutual benefit.

G.P.O. PLAYERS IN "COCK ROBIN."

"THE Adding Machine" and "Street Scene" are two plays which have brought Elmer Rice, the American dramatist, into great prominence. Collaborating with Philip Barry, he has now written "Cock Robin," in which the combination of mystery, romance, and highly amusing comedy is irresistible.

The Society's production of this play (for the first time in London!), under the direction of Hodgson-Bentley, will take place at the Guildhall School of Music Theatre, John Carpenter Street, E.C., on Thursday, Friday, and Saturday, Feb. 12, 13, and 14, commencing at 7.30 promptly.

Tickets (all reserved) 5s. 9d., 3s. 6d., 2s. 4d. may be obtained, post free, from Mr. W. L. Gartland, Room 13, fourth floor, G.P.O. (N), E.C.1. (Phone: Central 3,600, Ext. 871.)

READING NOTES.

MR. J. MAGNALL, late of Headquarter's Traffic Staff, has now taken up his appointment as Traffic Supt., Class I., Reading. In the first place we congratulate Mr. Magnall on his promotion, and secondly, offer him a very hearty welcome.

REVIEWS.

"The Post Annual, 1931." (Edited by George Middleton. Published by Percy Bros., London and Manchester. 88 pp. 1s.)

This annual is as good and interesting as ever, although this year its articles are confined rigidly to Post Office subjects. These are, however, sufficiently varied and deal with the history of Mail Coaches, Overseas Telephony, old London Post Offices, the Post Office and Betting Frauds, the P.O. at the "Great Exhibition," Some Exceptional Postal Packets, and other fascinating subjects. Some interesting old prints and newspaper blocks have been unearthed to illustrate these articles. The two fictional contributions have also a strong departmental as well as "love" interest. A frivolous enquirer asked us if the dashing Spanish lady depicted on the cover was a counter clerk or telegraphist. We assured him that we did not doubt that several of the staff suitably attired for a fancy dress dance could have served very satisfactorily as her model.

The profits from the sales of the annual will be given to the Post Office Sanatorium Society.

"Relays in Automatic Telephony." By R. W. Palmer, A.M.I.E.E., Assistant Engineer, Engineer-in-Chief's Office. Sir Isaac Pitman & Sons Ltd. 10s. 6d. net.

This book which is designed to cover the syllabus of the City and Guilds Examination with respect to telephone relays is, we believe, the first book to deal with this important subject in the way it deserves. It describes the construction of relays with, in some cases, illustrations showing each piece dissembled and labelled, their design and adjustment and the theories on which the different types are based. Over thirty pages are devoted to impulsing, i.e. the make and break of a circuit for the purpose of transmitting a number, and another thirty on time measuring instruments. Appendix I deals with the time-lags of A.T.M. type relays and magnets, and Appendix II contains an abstract of the appropriate British standard terms.

This book should be useful not only to the student in his preparation for examinations but also to the practical man who is not content with rule-and-thumb methods. As a complete exposition of present-day practice it should prove a good starting place for further research.

"Cables and Wireless Communications of the World." (Second Edition revised.) By Mr. F. J. Brown, C.B.E., late Assistant Secretary of the Post Office. Sir Isaac Pitman & Sons Ltd. Price 7s. 6d. net.

Mr. Brown has taken the opportunity afforded by the exhaustion of the first edition to revise and re-write wherever necessary, so as to bring the work up to date. The first edition was produced in 1927 and in the interim the cable and wireless interests have merged practically throughout the world, and the Government-owned British cables and "beam" services have been handed over to Cables and Wireless Ltd. The past few years have therefore made history in the world of communications; and the revised second edition is opportune as being right up to date and reflecting Mr. Brown's wide knowledge of the subject.

SOUTHAMPTON NOTES.

A VERY successful Staff Dance was held at the Bungalow Café on Dec. 22. The café was filled to capacity and the happy atmosphere surrounding the proceedings was excelled only by the splendid example of how these things can be done. Amongst those present were Mr. O. G. Lee, District Manager, and Mrs. Lee who kindly presented the spot dance prizes. We were pleased during the evening to be visited by the Surveyor, Mr. E. J. Gayes, accompanied by the Head Postmaster, Southampton, and a representative of the Headquarters Mails Branch. The proceedings terminated at 1 a.m. to the strains of "Auld Lang Syne."

The Committee are to be sincerely congratulated on the results of their efforts, which we all hope that they will repeat at an early date.

A WIRELESS MASCOT: THE MILLIAMMETER.

BY B. S. T. WALLACE, C.T.O.

HOLDING in his hand a beautiful little bronze statuette on a marble base, depicting a female figure with one arm extended and holding a lamp, a neighbour approached me with the question: "Could this be successfully silver plated?" He was advised that though it would provide a perfect medium for the electroplater's art it would be a pity to spoil the artistic effect of such a handsome piece of work. "Ah," he replied, "You do not understand. I want this for a mascot on my new car." On remonstrating that nothing less than a Rolls-Royce would live up to such a mascot, he rejoined that as he could not afford a first class car he was at least going to have first class accessories.

This is the mentality of a whole-hearted enthusiast. Whatever hobby or interest a man may adopt his true attitude towards it can be judged by the nature of the accessories he employs in conjunction with it. The car mascot may not come strictly within this category, but it illustrates an attitude of mind; a desire for the best thing for the purpose.

Wireless accessories can be divided into two classes: mechanical and electrical. The home constructor is principally concerned with the former but the latter applies to every user of a wireless receiver.

We will deal here with the electrical accessories. They are mainly confined to measuring instruments. It is desirable to be able to measure the voltage of filament, high tension and grid bias batteries; the filament current and the anode current of the various valves; and to trace faults with facility and certainty. The latter is by far the most important thing of all.

Some means of keeping a check on the voltage of the various batteries is a need soon felt. As a first experiment, a little experience will enable a flash-lamp bulb, or where necessary two of them in series, to be used as a voltage indicator. They will give the information usually desired, i.e., whether or not the effective working voltage is too low. The various stages of brilliancy are quickly noted and the just discernible glow of the lamp when connected to a battery on its last legs, to the full illumination of a new one, form a useful luminous indicator.

The cheaper types of voltmeter, though toys compared with a good instrument, are usually suitable for the purpose of general battery testing. Under some circumstances they are misleading and they cannot be used for eliminators. Their defects as voltmeters are: Uneven scale reading owing to the moving iron principle of construction; they are for the same reason not dead-beat; their resistance is too low and consequently they take too much current to give accurate readings of a source of E.M.F. which also has considerable internal resistance.

The first two defects are not likely to upset telegraph men who for generations have worshipped before that Gothic shrine, the P.O. standard galvanometer. For accumulators with negligible internal resistance a fairly accurate reading will be given. With dry batteries the accuracy of the reading will depend on the size and condition of the cells. Some cheap voltmeters require as much as 30 milliamps for a full scale deflection. A current of this magnitude will cause a voltage drop in most high tension dry batteries, so that the voltage indicated is not the true voltage but the voltage under a working load of 30 milliamps—quite a useful thing to know. If, however, the battery is measured while in use, the reading will be false. The same applies to H.T. eliminators, but in a more aggravated form; the popular type with a current limitation of 20 milliamps at 120 volts would probably

indicate 50 volts on a cheap meter. The utility of this instrument is mainly confined to accumulators and batteries which are not in use while measurements are being taken.

An accurate voltmeter involves the moving coil principle of construction, a powerful magnetic system and light, delicate moving parts. This necessitates skilled labour in its manufacture and may explain what appears to be a mystery to many amateurs: the comparatively high price of these instruments. In the ordinary course of events the expenditure may not be justified, but it will be shown later on that in meeting the greater need of the most important instrument of all—a milliammeter—a good voltmeter may at the same time be acquired for a small additional outlay.

There are a few uses to which the wireless man can put an efficient voltmeter. It will measure the actual voltage of batteries and eliminators while in operation. If a loss of voltage is suspected in the leads or connexions this can be proved by checking the voltage at the valve filament legs. It will give the true voltage on the valve anodes, which is often lower than suspected owing to voltage drop in transformers, loudspeakers, chokes, &c. The voltage drop across resistances can be measured, and the value of unknown resistances calculated.

A check on filament current is not nowadays of much importance. Modern filaments are very robust and, providing the voltage rating is adhered to, the current consumption of valves of a particular type is about as constant as an ordinary electric lamp.

The expensive early forms of dull emitter valves had filaments which were both mechanically and electrically very fragile. They were nursed like jewels in cotton wool and invariably used with filament rheostats. The best working voltage was an uncertain factor, the main precaution being to see that the filament current did not exceed a certain specified value, otherwise the electron emission would be destroyed and the filament sag on to the grid or break to pieces. Under such conditions a filament ammeter was a desirable adjunct to a receiver.

With the development of wireless receivers one factor has progressively increased in importance: This is the anode current of the various valves, and the success of the modern set is dependent on the adequacy and constancy of it. Every good receiver of any pretensions at all should have a milliammeter permanently connected in circuit. It is as necessary as the familiar galvanometer in a telegraph circuit, for it gives a visual indication of practically all ordinary causes of breakdown that are likely to occur, and can be used to locate quickly a fault that is not at first apparent.

A milliammeter connected in the negative high tension lead of your receiver will give a visual indication of all the following faults, and the diagnosis of some of them will be detailed at the end of this article. It will indicate a fall in voltage of the L.T., H.T. or grid bias batteries; when a valve has burnt out; distortion due to wrong grid bias or overloading of valves; breakdown in transformer, choke or coupling condenser; disconnection in the windings of a loudspeaker where the latter is in the anode circuit; faulty contact at the valve pins; failure of valve emission; disconnected or badly fitting feed or "de-coupling" resistances; faults in smoothing condensers; leakage due to bad insulation; whether or not your set is oscillating. Those elusive faults characterised by complete silence and usually associated with faulty grid circuits are soon traced by its aid.

An efficient meter for the purpose must be of the dead-beat moving coil type, of low resistance, and with an open scale. It should, when required, be able to give a deflection of half an inch per milliamper when dealing with small currents as when taking observations on a detector valve, and be capable of registering up to 25 milliamperes for power valve and total current purposes. This implies a double range meter, serviceable readings being 1 to 5 milliamps on open circuit and 1 to 25 milliamps with one-fifth shunt. Except as a rough guide occasionally the cheap moving

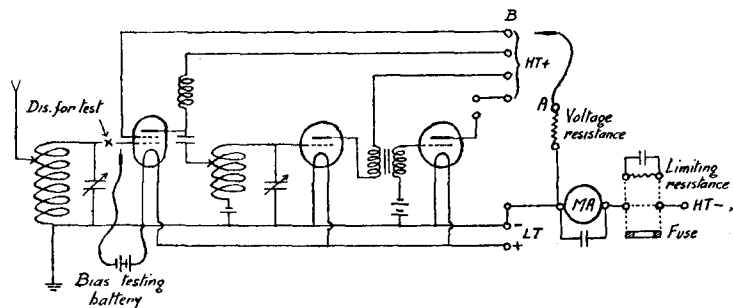
iron type of instrument of high resistance is unsuitable for our purpose.

There are two points first to be borne in mind when using a milliammeter. In a few exceptional cases the resistance and inductance of it may be sufficiently high to cause a slight coupling in the receiver or a reaction between low and high frequency currents when it is placed in a common battery lead feeding several valves. This difficulty is overcome by bridging it with a condenser of .01 mf. or higher. Some milliammeters manufactured for the purpose have small by-pass condensers fitted internally. These instruments have the letters H.F. engraved on top of their dials, signifying they can be used to measure direct currents which contain also a high frequency component. The matter is mentioned in passing; actual trouble from this source is rarely experienced with an instrument of a few ohms resistance.

Secondly: Should your pet receiver be one of those glorious contraptions consisting of a maze of wires straggling around a baseboard and your enthusiasm such that precaution is at times thrown to the winds, then it is advisable to provide some protection for your instrument, which is likely to come to the same sudden end as your valves if the H.T. battery is accidentally short circuited across it. There are two methods of protection. A low-temperature fuse, or a limiting resistance, can be placed in series with it.

Low-temperature fuses of the lamp type, besides taking an appreciable fraction of time to "blow," momentarily pass a heavier current than their rated value before heating up; so this method requires careful consideration before adoption, as these meters are very quick in response. Fuses of a new pattern to melt with a current as low as 5 milliamps. have been manufactured recently, but the writer has had no experience of them.

A limiting resistance is a sound safeguard, though its practical application will reduce the H.T. voltage at the anodes and make it suitable only for experimental work or where the anode current is comparatively small. Take the example of a meter with a full scale deflection of 25 milliamps. It is desired to limit the possible current through it from a 120-volt battery to 30 milliamps (a temporary small overload being permissible). A simple calculation gives the required resistance as 4,000 ohms, the internal resistance of the meter being ignored. A 2 mf. condenser must be placed across this resistance. It is connected as indicated in the diagram.



Arrangement of Milliammeter for Testing and Tracing of Faults.

These safeguards are unnecessary if one is habitually careful or when the meter is made a permanent fixture in a well-designed receiver.

It is a very simple matter to utilise a milliammeter as a voltmeter, and for measuring the voltage of the H.T. battery it can actually be left in its permanent position, the only additional necessity being the appropriate series resistance for the voltage reading required. Taking again a full scale deflection of 25 milliamps. and a voltage of 120 to give this deflection, the series resistance necessary is $120 \div \frac{25}{1000} = 4,800$ ohms. The internal resistance of the meter may again be ignored. (Actually it should be 10 ohms or less.) Each milliamp. will now represent 4.8 volts. The resistance is connected as in the diagram, a temporary lead being taken from A to B for voltage tests. The filaments should be switched off when a voltage test is being made with this arrangement.

The internal resistance of this improvised meter is too low for some purposes, but accommodation for other needs is met by increasing the series resistance and reducing the scale deflection per volt. Taking an extreme case, the measurement of eliminator voltage, a series or internal resistance of 120,000 ohms would be suitable. A voltage of 120 would then only give a deflection of 1 milliamp. This would be too small unless the meter also had the more open scale of 5 milliamps for a full deflection. The value of a good multi-range meter with a wide scale can now be appreciated.

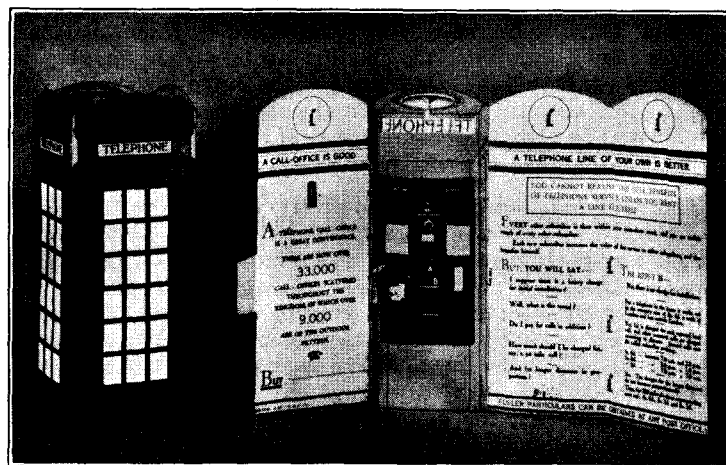
For all practical purposes a suitable wire wound anode resistance can be obtained for most values from 1,000 ohms upward, or the milliammeter scale can be calibrated to the nearest resistance obtainable. If a value of 4,800 ohms is theoretically required and the nearest value in this type of resistance happens to be 5,000 ohms, then recalculate the equivalent voltage reading. This will now be 125 volts for full scale deflection.

Anode resistances are not intended to be literally accurate to their marked figure, though they are usually very close to it. The makers are sometimes sufficiently obliging to pick out these resistances specially and having their true resistance measured before despatch if it is pointed out that they are required for use as voltage multipliers.

For checking the resistances, if necessary, a good working accuracy for most purposes can be obtained by using a two-volt accumulator about one quarter discharged and accepting this as a 2-volt standard. If your milliammeter is accurate it will be found that a resistance which gives a deflection of 2 milliamps. with the 2-volt accumulator will, plus the internal resistance of the meter, be very close to 1,000 ohms when measured on a Wheatstone bridge. The result could also be checked on a voltmeter of known accuracy.

This is only half the story. It is quite safe to assert that if you are of a restless, enquiring disposition in matters wireless and always on the look-out for some improvement to your receiver or a better understanding of its operation, from a few weeks' intelligent use of a milliammeter you will learn more than from many years' reading of wireless books and papers. It is difficult fully to comprehend the functioning of a complicated receiver without actually handling this instrument in the various circuits. However good you may be in your theoretical grasp of the subject, or in constructional ability, there is always a fuller satisfaction when a calculated value is experimentally proved or an unknown value visually demonstrated.

(To be continued.)



Novel folder in the form of a telephone kiosk (coloured pillar-box red) which has been distributed to non-subscribers. The demand for them has been enormous.

CORRESPONDENCE.

PROBLEMS OF THE TELEGRAPHS: RECRUITMENT AND TRAINING.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—At a time when the organisation of the British Telegraph Service is very much in the melting pot it may not be inopportune to refer to a particular aspect of the problem which has not, so far as I am aware, been specifically dealt with in the pages of the *Journal*.

I refer to the allied problems of recruitment and training.

Speed and accuracy are the criterion, and the only possible criterion, of an efficient telegraph service. The public may demand no more than a relatively high standard of speed coupled with an absolute standard of accuracy; it will certainly be content with no less.

Now speed is dependent mainly upon three factors: (a) The capacity of the apparatus employed. (b) "Office lag" (taking the term as including the time occupied in internal circulation and in delivery). (c) Operating ability.

The capacity of the apparatus is a fixed quantity—in the case of the teleprinter 60 words per minute—and since the factors which govern "office lag" are well-known and the remedies reasonably obvious we may proceed to consider the third and last factor of "operating ability."

It seems reasonable that we should begin with the question of recruitment. The importance of a clear understanding as to the class of recruit which it is desired to attract cannot well be over-estimated, since here is the raw material upon which to a very great extent depends the quality of the finished article—in other words the efficiency of the Telegraph Service.

Dealing with recruitment to the Telephone Service, Sir Evelyn Murray, in his work on the Post Office, writes as follows:—

"Candidates who pass the ordeal of the Selection Committee—in London only about 20% are accepted—are then put through a systematic course of training in the Telephone School, after which they are allowed to take charge of the lighter circuits. A good operator requires a combination of many qualities, manual dexterity, clear enunciation, alertness of mind, an accurate memory and last, but not least, a placid temperament. The period of training depends largely upon the aptitude of the individual; the majority are able to do some effective work on live traffic in two or three months, but it usually takes more than a year before they are equal to handling a normal load. As a check upon operating efficiency, records of a large number of calls are taken daily with a stop watch in London and the large towns."

The same meticulous care which is expended upon the selection and training of recruits to the L.T.S. is, it is submitted, equally desirable in respect of the sister service.

While it must be conceded that with the introduction of the Teleprinter telegraphy is destined to become a less highly skilled occupation, it is nevertheless true that a high standard of operating skill plus a certain level of intelligence and education remains a necessity if the telegraph service is to re-establish itself in the confidence of the public.

There has been of late evidence of the existence in certain quarters of a belief that it is possible to evolve an official telegraphist out of hastily selected and indifferent material in a very few months and after a perfunctory training. It is submitted that such a belief is superficial and fallacious. The ability to read, say, 50 to 70 telegrams per hour, paying due regard to the sense and contents, calls for a very considerable amount of intelligence and alertness of mind, more particularly when we remember that the operator is required to detect and correct the obvious textual errors which not infrequently occur—and this takes no account of the high degree of manipulative skill required in the actual transmission.

Again, the reception of 50 to 70 telegrams per hour, the affixing of these to the relative forms, the scanning of each individual message, the correction of obvious errors, the counting, signing and entering, the observance of special regulations as regards particular classes of telegrams, &c., &c. All this, if the work is to reach a high standard of accuracy, demands a not inconsiderable amount of intelligence and skill.

Enough has perhaps been said to justify a claim that recruits to the telegraph service should possess a certain level of intelligence, together with very considerable alertness of mind. It is little short of amazing to find that large numbers of young people who have passed through our elementary schools are unable to read ordinary manuscript with facility and accuracy—but so it is.

Without claiming to be at all original I would venture to put forward the following suggestions for consideration, believing that if adopted they would contribute materially to the efficiency of the service:—

- (1) Candidates should be required to submit themselves to a test in the reading of longhand telegrams under ordinary service conditions.
- (2) Candidates should be subjected to a simple test in digital flexibility and control.

- (3) The recruitment of temporary labour to cover seasonal requirements should, so far as possible, be discontinued.
- (4) Training (which should largely be confined to the winter months) should be intensified; that is to say, a sufficient number of tutors should be made available to insure practically individual instruction.
- (5) Under no circumstances should learners be permitted to undertake live work until they shall have acquired a thorough proficiency in the reading and scanning of telegrams.
- (6) The office lay-out should be planned with relation to staffing qualifications.

I cannot do better than conclude these few observations with a further quotation from Sir Evelyn Murray's work. Referring again to the L.T.S., he writes:—

"A successful telephone service depends as much upon efficient operators as upon efficient plant."

A wise aphorism which will surely commend itself to all who are interested in the future of the telegraph service.

C.T.O., Dec. 18, 1930.

MENSANO.

THE TELEPHONE CONTRACT OFFICER.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—Your correspondent, W. J. R., in last month's issue, appears to be suffering from the rather conflicting mental effects of alternating between feeling like a responsible official and then simply a house-to-house canvasser.

The latter occupation can be most depressing and discouraging, especially where the district is old and the property converted into tenements and flats. Frankly, I sympathise with anybody engaged in such work, as the results rarely give a sense of personal achievement.

A good "Ten for the Bourse" or an hour's non-stop run on "India," gives a definite feeling of satisfaction.

The reception given to the average canvasser is not flattering, and it is necessary to create an air of importance before a hearing is obtained.

It cannot be expected that a potential subscriber will sign on the doorstep, and it is only in isolated cases where this actually happens. A one year's agreement is something which requires a little thought.

The primary object of the canvasser in making a new call should be to give the individual something to think about: something to discuss with the family.

Now I find that most people are interested and somewhat impressed by the mere mention of the word "engineers," and such subjects as local re-cabling, spare cables, exchange expansion, manufacturers' contracts, and even the employment of extra labour will often create a topic for an interesting conversation. The canvasser feels that he is obtaining definite information for these points and at the same time has left the necessary particulars for a telephone installation.

The "servile servant" can now feel like a civil servant if he wants to and can wear his normal size in hats once more.

Canvassing is something of a game of wits, and friend "R." is really not incapable of exercising his wits to advantage and profit.—Yours faithfully,

W. F. C. (S.E. Contracts).

HOW TO DEVELOP THE TELEPHONE SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—When I forwarded my letter, which you were good enough to publish in the October issue of your *Journal*, I did so in the hope that it would stimulate interest in this all-important question. I also thought it might encourage others to forward helpful suggestions.

Judging by the paragraphs published in your December issue, I may have accomplished the first part of my objective; but, so far, not the second. I think this a pity, because if the latter is attained, telephone development may be accelerated.

I should like to say that I am in agreement with R. G. R. as to the qualities necessary to make a successful contract officer. The other two letters published consist largely of criticisms of my suggestions. Both "Clerical Officer" and "A Contract Manager" will, no doubt, expect a reply, and, with your permission, I will not disappoint them.

One of the paragraphs in my article reads—"It should be obvious, that the more residential subscribers that can be obtained, the more necessary is it for the residential non-subscriber to have the service for social and other purposes," &c. Surely "other purposes" include business, and "Clerical Officer" has no grounds for assuming that I meant otherwise. He goes on to suggest that it is for business reasons mainly that many have the service installed in their homes. I agree, but I part company with him when he suggests that the social aspect of the service for private residences may be stressed to excess.

Telephone development has now reached a stage where, if further immediate and substantial progress is to be made, residential lines must be secured in larger numbers. After 10 years as a residential subscriber, I unhesitatingly say it is impossible to stress too strongly the social aspect of the service.

"Clerical Officer" then goes on to suggest that the small shopkeeper develops the necessity for service for his own convenience before any question of self-preservation is reached. Here, I say, he is speaking without practical experience. For example, in small exchanges the growth often goes in spurts. This is accounted for by the fact that an officer may secure an order from a resident. He naturally asks the potential subscriber for the name of his butcher, grocer, &c. The officer then canvasses them, and, as a result, secures further orders. Having secured an order from, say, John Jones, butcher, he makes it his business to let William Smith, another tradesman in the same line of business, know of Jones' intention, and so yet a further order is secured. Now, what prompted Smith to subscribe? I say there is no doubt, self-preservation was the chief reason.

Your correspondent then goes on to ask, what if a customer is already using call offices or kiosks? My reply to this is, that in my article I referred specifically to small shopkeepers. Their premises are, usually, not far distant from the customers' homes, and I do suggest that a non-subscriber, once having to leave home to shop, is most unlikely to do this by means of telephone calls, when the butcher's or grocer's premises may not be much further away than the nearest call office or kiosk.

It is also suggested by him that a message rate is similar to the guaranteed call office rate. Here he is totally at sea. Reading his article, one would be inclined to think that every ceasing subscriber, could, if he wished, continue on a guaranteed call office basis, but this is not so.

I am sure he will agree, that when a subscriber guarantees a call office, there is a moral, if not an implied, obligation, on the part of the department, not to provide similar facilities within an easy distance. It therefore stands to reason, that if guaranteed call office rates were offered freely to the public, it would be stultifying the department in their policy of erecting kiosks.

Experience, in this district, has proved that even subscribers with a "You may Telephone from here" sign, object to the erection of kiosks, and to prevent this, whenever a subscriber requests such a sign, it is now made clear to him by letter, that it is fitted on the distinct understanding that the Postmaster-General reserves the right to establish a call office in the vicinity of his premises.

The copy of the letter, with the subscriber's acknowledgment, is filed with the agreement.

"Clerical Officer" suggests that the message rate proposed does, in fact, already exist in more favourable form, meaning, presumably, the guaranteed call office rate. Such a suggestion, bearing in mind that we are discussing private residences, is, I consider, grotesque in the extreme.

I also disagree that private residences would be likely to ask for signs to be fitted (except in very rare cases), but if they did, I cannot see how the service would suffer as a result. On the other hand, it would help to make the service more accessible to everyone.

Finally, because I state—"It is easier to obtain orders to-day than 20 years ago," "Clerical Officer" thinks this suggests that salesmanship is being superseded. Again I disagree. New subscribers may be divided into two classes (1) those who subscribe without persuasion, (2) those who do so as a result of canvassing effort.

The number of the first are continually increasing, hence it is easier to obtain orders to-day than 20 years ago. But number (2) is also increasing in the same ratio, hence salesmanship is necessary, and, as the service increases the number of potential subscribers will do likewise, and the staff will need to be increased proportionately.

A "Contract Manager," says "the great majority of the private residence subscribers are people who have become convinced—either of themselves or through the contract officers, that a telephone in the home is, for one reason or another, a good thing from a domestic point of view. I am one myself. I became one simply because I desired in certain circumstances the safeguard and convenience of telephone service," &c.

Like him, I have found from actual experience that telephone service, from a domestic point of view, is a good thing. Contract managers are heads of the department whose business it is to sell telephone service for residential or domestic purposes, and after the striking testimony of one of their colleagues as to its utility, I am content to leave it to your readers to judge whether contract managers ought to set an example by becoming residential subscribers.

CONTRACT OFFICER, CLASS I.

Bristol, Jan. 3, 1931.

LONDON ENGINEERING DISTRICT NOTES.

New Exchanges.—On Jan. 1, Gulliver Automatic Exchange (Kentish Town) was opened with 1,300 subscribers transferred from Hampstead Exchange. The equipped capacity of the new Exchange is 4,400 lines.

On Jan. 17, Gladstone Automatic Exchange, which as reported in last month's notes was already in working order as a parent exchange for Hendon

Exchange, with Colindale as a hypothetical exchange, was opened with a transfer of 2,300 subscribers from Hampstead and Willesden Exchanges. The equipped capacity of the exchange is 5,100 lines.

126-128, *Cromwell Road.*—With the transfer of Frobisher Exchange to the Flaxman Automatic Exchange, the association of 126-128, Cromwell Road, with telephone exchanges comes to an end after 29 years. The old Western Exchange, which was the fourth P.O. Exchange in London, was opened at 126, Cromwell Road, on Aug. 5, 1902. The exchange originally occupied only No. 126, but the adjoining premises, No. 128, were acquired in 1907, and the exchange extended to its full capacity in 1908. The re-arrangements consequent upon the development of automatic exchanges in London made it necessary to find a new site for the proposed Western Automatic Exchange. In the meantime, in order to give much needed relief in the neighbouring areas, Frobisher and Fulham were opened as hypothetical exchanges on Western in 1927. On Jan. 5, 1929, Western Automatic Exchange was opened and the old Western Manual Exchange became Frobisher, a relief manual exchange with Fulham Exchange working on the same equipment as a hypothetical exchange. On July 27, 1927, the subscribers on the hypothetical exchange were transferred to Fulham Automatic Exchange, and on Jan. 3 this year the remaining subscribers on Frobisher Manual Exchange were transferred to Flaxman Automatic Exchange as a hypothetical Frobisher Exchange. The building, however, will not entirely lose its connexion with the telephone service, as it is probable that it will be used ultimately as offices for one of the Sectional Engineers.

Engineering Work.—Extensive excavation work is now in progress at Hammersmith Broadway, which is one of the most congested spots in London. This work is in connexion with the provision of a new tunnel for the extension of the Piccadilly Railway to Northfields and Hounslow via Turnham Green, and necessitates the diversion of a large number of telephone cables crossing the Broadway in order to clear the new steel work for the tunnel heading. Fortunately it has been found possible, by arrangement with the Railway Company, to retain two important Trunk cables over their present route crossing the Broadway, the pipes in which these cables are accommodated being suspended temporarily.

It is interesting to note that although the centre of the Broadway is of necessity closed to ordinary traffic, arrangements have been made to maintain the tram service, requiring special support for the track crossing the excavation.

Arrangements have been made with the Police, Ministry of Transport, and with the Railway Company's Resident Engineer, Mr. Drain, to reduce to a minimum the obstruction caused by the tunnelling and trenching required for the new cable tracks to a minimum, and there is every reason to hope that the diversion work, the proposals for which have been somewhat complicated, will be carried out without interruption to the service.

The vibration of the suspension bridges has always been a source of trouble to cables passing over them. Defects in the sheathing have generally been acute near to bridge heads and buttresses. At Chelsea Bridge two lead-sheathed cables are now being renewed by cables with sheathing of antimony, cadmium and lead alloy. A further protection is also being taken to minimise the effects of the vibration by providing a bight in the cables at each buttress.

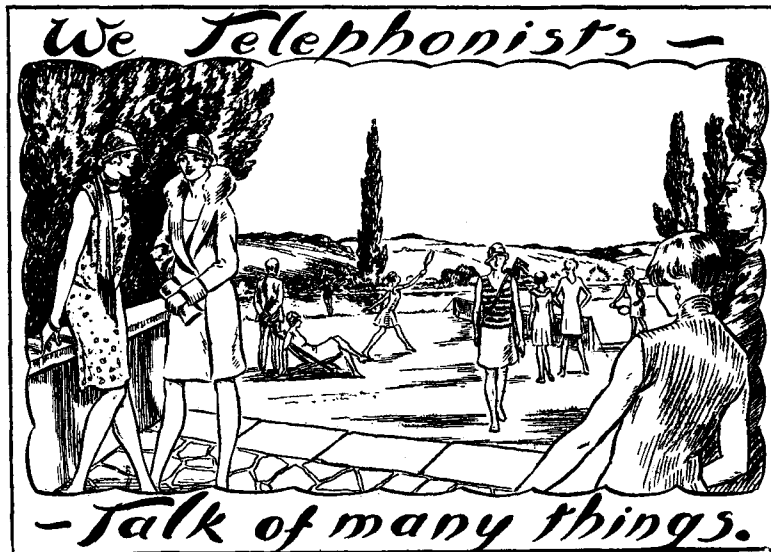
Two other cables cross the bridge and are provided with connecting lengths of V.I.R. leads at the bridge heads and buttresses, but have not proved as effective as anticipated, and steps are now being taken to replace these lengths also by the special sheathed cable already mentioned.

Retirement of Mr. T. V. Jones.—On Jan. 30 a number of colleagues of Mr. T. V. Jones, Assistant Engineer, Centre External Section, assembled at an informal gathering to say farewell to him on the close of a long and interesting career in the service of the Post Office. Mr. Jones, who retires owing to age limit, entered the Engineering Department in an unestablished capacity on April 5, 1894, and was placed on the Establishment two years later. He was appointed Sub-Engineer on Aug. 6, 1902; Chief Inspector in 1911 and Assistant Engineer on May 10, 1920. Except for a short period in the Eastern District, the whole of Mr. Jones' experience has been in London. During his long service he has been engaged on most branches of Post Office Engineering work, particularly external construction. His cheery disposition made him very popular with his colleagues, who presented him with a clock as a token of their esteem and good wishes.

Chess Club.—An interesting feature in the Chess Club's activities took place on Dec. 18, when Mr. A. G. Fellows, Chess Editor of the *Watford Observer*, Hertford County Champion player, and also at one time Chess Problemist attached to the staff of the *Daily Mail*, gave a simultaneous display in the club on sixteen boards.

The club are to be congratulated on the result as only six of the games were lost. Five games were won and five drawn.

Mr. Fellows was cordially thanked by the Secretary of the club for a most entertaining evening, and replied that the club prospects should be excellent in their season's engagements, as he found a very high standard of play on all the boards.



The Armada-Wallopers.

Oh! to be in Devon now that winter's here—or for that matter, spring, summer, or autumn.

Didst see the reference to us, oh Editress, in the last issue under Western District Notes and dost not think that matters require our personal investigation—in *re* “feoffees” and “potwallopers,” to wit? Perhaps it would be better if I went alone, because apparently even the inhabitants are unable to meet together in large numbers, owing to the wild nature of the district. What a place! And they sing about it as “Devon, glorious Devon.” Ever since Drake instituted the “Order of the Armada-Wallopers”—whose badge of membership is four woods and a jack strung about the neck—Devon has been telling the world. They take credit to themselves that Devon rhymes with Heaven (or vice versa)—but as a matter of strict fact it doesn't (except in the vernacular). Of course, much if not all may be forgiven a people that invents Devonshire cider, cream, splits, and teas, and Devon fires, and very kindly accommodates our “bad-hats” at Princetown; but why make a fuss about their “feoffees” and “potwallopers”?

According to my less well-thumbed dictionary a “feoffer” expressed on the land, or in sight of it, his intention to convey the land to the “feoffee.” The symbol of conveyance was a clod of earth. Why, there are any number of “feoffees” up and down the country at any honest-to-goodness election. True the feoffer may not always give prior advice of his intention to invest the recipient with land (or a clod) but the conveyance is always well and truly made. And what the feoffee gets is his “in perpetuity” and possibly “in aural orifice.” Modern usage, I may add, favours an egg or a love-apple as the symbol, but the sentiment is the same.

As to the “potwallopers” I am glad to note, in passing, that the golfer's explanation has been accepted with reserve. When you come to think of it who would care, let alone dare, to accept a golfer's explanation? Once a man is stung by a caddy or bitten by a wild golf cub, he may do or say anything. If he be a hardened golfer, he will doubtless have his breakfast egg served up on a tee of sand instead of in an egg-cup. The particular golfer in question is evidently an archer (a toxophilite, in politer terms)—does he not draw the long bow—and as such he probably endeavours to emulate William Tell by shooting a golf-ball off a caddy's head with an arrow. This sport is alleged (by a golfer, of course) to have inspired the song, “I shot an arrow into the hair.”

However, enough of golfers and golf; they are anachronisms in the shire of the Armada-Wallopers.

Let us return to potwallopers. A potwalloper or potwaller (same thing) is one who, having a pot of his own, provides and cooks his own food. As recently as a hundred years ago, such people had the right to vote in certain places at elections. So next time you go camping and cook your own food in your own dixie you will be a potwalloper. But although you won't on this account be allowed to vote you may be allowed to play golf. And if while playing you get a divot in the neck, just remember with pride that you are a feoffee.

PERCY FLAGE.

Directory Enquiry.

As the swallow comes in summer
And the cuckoo comes in spring,
So each day at Central D.Q.'s
Hosts of queer enquiries bring.

Do you know a Mr. Smith, Miss?
Used to live at number five,
I'm not sure about the road, Miss,
Or if he is still alive.

Then we get another caller,
“Madam, I have lost my cat.
Do you know where I can find it?
It was last seen on the mat.”

Then a batch of these enquiries
In the midst of all the strife—
“How obtain a marriage licence
As I wish to take a wife?”

“Our new maid, to wit, Matilda,
Has gone funny in the head;
Shall I ring the local doctor,
Or will chemist do instead?”

“Is it foggy down the river?
Where is coop-tie played to-day?”
“A good home to place a baby
Where it can in comfort stay?”

“Can you quote a bus to Moorgate
That goes near to Leadenhall?”
“Can you recommend a fish shop
Whence the man will daily call?”

These are but a few examples
Of enquirers' varied style.
As our staff is filled with humour,
Do you wonder that they smile?

D. D.

London Telephonists' Society.

The Dance at Lyons' Corner House was very well attended, the scene was new, the frocks were, too, the catering was splendid, and everyone enjoyed the fun and danced with one another, the while sardonic bandmen played “Go home and tell your Mother.”

Less skilful men looked daggers when our President was tendered a pressing plea “Please dance with me,” and gracefully surrendered.

The frocks, of course, were long—oh, dear! Where *were* the knees of yesteryear?

A night so spent too quickly went, we parted, willy-nilly—to meet anew in '32, at Lyons, Piccadilly.

Contributions to this column should be addressed: The Editress, “Talk of Many Things,” *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

NORTH-EASTERN DISTRICT: YORK.

A WELL attended gathering of the staff was held in the District Office on the evening of Jan. 2, in order to say farewell to Mr. G. Edward, District Manager, on the occasion of his being transferred to a similar position at Brighton. About sixty members of the staff were present and the chair was taken by Mr. W. Garrow, Staff Officer, who spoke feelingly of the loss of Mr. Edward, and extolled his virtues as a District Manager and a staunch friend. Mr. F. E. Adams, Contract Manager, in the course of a characteristically breezy speech, presented Mr. Edward with a handsome Westminster chime mahogany grandmother clock as a token of the respect and esteem of the staff in the York and Middlesbrough sections of the North-Eastern District. He was ably supported by Mr. J. McCormick, Traffic Superintendent, Class I, Mr. A. Burdett, Chief Clerk of the Middlesbrough section, and Mr. J. Turner, Contract Officer, Class I, who all expressed their deep regret in losing such a patient, considerate, and excellent chief in all respects, and wished him the very best of luck and prosperity in his new district.

Mr. Edward thanked the staff for their very loyal co-operation during the three years he had been with them, and for the kind expressions of their goodwill and the handsome token of their respect and esteem. He said he had been very happy in the district and was sorry to go, but York had not been kind in the matter of health to his family and the change to the more congenial South might prove beneficial. The meeting finished with the singing of “He's a jolly good fellow” and rousing cheers for Mr. and Mrs. Edward and family.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch, during the month of December, resulted in a net gain of 810 stations. The number of kiosks existing in London at the end of 1930 was 2,162, and there were Advice Notes outstanding for 130 more. During the year, 581 new kiosks were provided which represents an increase of 36% on the number existing at the beginning of the year.

Last month we referred in these notes to the progress made in the Wallington exchange area. The history of the advance made in the Sutton area is equally interesting. In 1924, when a development study of the district was carried out, there were some 1,450 direct exchange lines in the area, an increase of 557 in five years. By the end of 1930 the number of direct exchange lines had grown to 4,137.

A gathering of the staff assembled in the Contract Branch Development section, on Dec. 31, 1930, to wish good-bye and good luck to Mr. L. W. E. Dawe, Male Clerical Officer, who has resigned. He is leaving the country to take up a course of study at the College of Osteopathic Physicians and Surgeons, Los Angeles, California.

Mr. Dawe entered the Service as a Boy Clerk some fifteen years ago and for the last seven years has been employed in the Development Section. Mr. G. E. Nicholls, who presented Mr. Dawe with a fountain pen and cheque, remarked on the courage and determination that was necessary to embark on a new career. He felt sure that Mr. Dawe was undertaking something that most would fear to do. Mr. Dawe, in returning thanks, said that in spite of his hopes and aspirations he felt very keenly his departure, but would be fortified in his fight to succeed by happy associations and the encouragement extended to him on every hand.

L.T.S. Sports Association.

Football.—The story of the match between the L.T.S. and War Office could be written round 3 penalty kicks. Two were given in the first half and one in the second and a goal was scored from each. It was expected that this match between two teams occupying the first and second positions in the League table would be keen, and in fact it seemed that the players were conscious of the importance of the game throughout, with the result that vigour was too frequently introduced at the expense of science and the man was too often preferred to the ball with the result that three penalty infringements were committed. Good football was provided in flashes and for consistency Futerman, Casey, Osborne, and Barrett were outstanding.

Casey converted the two penalties awarded the L.T.S. Osborne, the smallest man on the field did the work of two men. Of the backs, Constable was the steadier. The play of Webdale suffered somewhat after a little affair with the outside left of the War Office. Williams, in goal, had not a great deal to do, but one save of his in the first half, when the ball, after being deflected by one of his backs, seemed certain to cross the line, was a really first class effort. The result was a victory for the L.T.S. by four goals to two, and establishes them at the head of the League table with a maximum of 18 points out of 9 games played.

The London Telephonists' Society.

The Annual Dance of the London Telephonists' Society was held on Friday, Jan. 16, at Lyons' Corner House, Coventry Street, W.1. The melody and rhythm of Mr. Skinner's Orchestra, which has been so enthusiastically received for many years by the regular supporters of this Annual Dance, combined very happily with the atmosphere of brightness and gaiety which we associate with functions held at the Corner House, where the organisation is such as to ensure complete ease and smoothness. For the comfort of all who attended the dance, it was necessary to limit strictly the number of tickets issued. The Committee of the Society were sincerely sorry to be obliged to disappoint late applicants for tickets, but feel sure they will understand that, as the size of the ball-room could not be expanded, an attendance limit had to be fixed and observed.

The evening was unquestionably a great success and we extend our warm thanks to those who supported the Dance, as well as to Mr. Buckridge, the Chairman of the Dance Committee and Miss McAllister, our Secretary.

On Friday, Feb. 6, Mr. W. C. Griffith, who went recently to America to investigate the long distance system of telephony obtaining there, will address the Society. Mr. Griffith has specially adapted his paper, and prepared a large number of slides, to make his subject of particular interest to Exchange Staffs, and it is hoped that the attendance at the Aldersgate Street Y.M.C.A. on the evening in question, will constitute a record.

L.T.S. Sanatorium Concerts.

Another visit was paid to the Holy Cross Sanatorium, Haslemere, by the Concert Party organised by the Staff of the L.T.S., under the direction of Miss Margaret Worth, on Saturday, Dec. 29. Previous experience indicated

that a light and humorous programme was suitable to the patients, most of whom were young people, and Miss Nan Kenway (who also proved to be an excellent accompanist), Miss S. Arthur Samuels, and Wilfred Stracey, kept the audience in roars of laughter. Miss Worth and Mr. Hugh Williams sang ballads and duets and contributed in no small measure to the success of the programme.

At the conclusion the Padre conveyed to the artistes and to the Staff of the L.T.S. the heartfelt thanks of the patients for the excellent programme provided for their entertainment. Miss Worth, in replying, stated it was a genuine pleasure for her friends and herself to come to the Sanatorium and do their utmost to amuse the patients and staff. She felt sure that if only the members of the L.T.S. who contributed to the funds to provide these concerts had been able to attend they would feel amply repaid.

The first concert of the season at the National Sanatorium, Benenden was held on Jan. 3. A warm welcome awaited the artistes who were received by the Matron and Staff, and after being regaled with tea, much appreciated after a long motor ride, proceeded to the Concert Room. Here item after item was encored, and a more varied and enjoyable concert has not been held there for many a day.

Miss Nellie Beare, a great favourite at Benenden, was at her best. Her songs and also the duets with Mr. Hugh Williams were enthusiastically received. Miss Nan Kenway, in songs at the piano, monologues and step dancing, was blythe and gay throughout, and did much to add to the enjoyment of the programme. Mr. John Harris proved an efficient accompanist and was also most amusing in song and story. Another entertainer, ever welcome at these concerts, Miss Mollie Albridge, maintained her high standard of proficiency and delighted the audience with her charm as well as merriment.

Community singing and songs and duets by Miss Worth and Mr. Hugh Williams completed one of the best programmes presented at Benenden.

In response to the hearty vote of thanks proposed by the Medical Officer, Miss Worth assured the audience that she and her friends, the artistes, enjoyed these concerts as much as the staff and patients did, and added it was a real pleasure to come and do their best to while away an hour or two in such good company.

Presentation to Mr. H. G. Corner.

The last day of 1930 coincided with the last day of Mr. H. G. Corner's official career as Superintendent of Traffic in the London Telephone Service. Mr. Corner has been associated with telephone work for thirty years, both with the National Telephone Company and the General Post Office, and it is not surprising that he has become a very prominent figure in the London Telephone Service. The regard in which he is held is best reflected by the large number of his colleagues of all ranks who assembled at Cornwall House on Dec. 31 to bid him an official farewell.

The gathering was presided over by the Controller, Mr. W. H. U. Napier. In one of his characteristic speeches, Mr. Napier enumerated the chief events of Mr. Corner's career and, on behalf of the staff, presented him with various gifts as tokens of that affection and esteem that the staff felt towards him. The gifts included a Pye wireless set, suitcase, and a cheque.

Mr. H. Dive, the Assistant Controller, and Mr. W. B. Benham, who has been closely associated with Mr. Corner during the whole of his service, supported the Controller and made reference to the many humorous incidents associated with Mr. Corner's official duties.

Mr. Corner, in reply, referred to the difference in the conditions which prevailed at his entry into the telephone world and those now existing. He recollected that when he entered the service of the National Telephone Company, his first duty was to formulate replies to letters of complaint received from subscribers. Prior to his advent the Company had apparently thought it unnecessary to reply to such communications! The training period on this duty, according to Mr. Corner, occupied a period of 30 minutes. As a result of the successful manner in which he performed these duties, Mr. Corner was promoted and became Exchange Manager of Holborn. Again a further period of training was necessary in traffic duties, more prolonged, of course, than in the previous case. On this occasion the training was extended to four hours! Mr. Corner drew a parallel between his case and that of a young traffic officer of the present day, whose period of training occupies 36 weeks. Proceeding, Mr. Corner paid a tribute of appreciation to the staff who had worked with him, and expressed his deep appreciation of the kindness of his colleagues in presenting him with such magnificent gifts.

Included amongst the gifts was a collection of the five volumes which represent the labours of the Royal Commission appointed to survey the historical monuments of London. This gift is of particular interest, as Mr. Corner is himself one of the leading authorities on the historical and topographical aspects of London, and we are looking forward to seeing at no distant date a contribution from his pen on this particular subject.

Presentation to Capt. H. A. Berry.

Those of our readers who complain that nothing really interesting is recorded in these notes, should have been present at the assembly which took place in the Conference Room at Cornwall House on the 2nd instant. The occasion marked the presentation of a handsome mahogany Columbia Cabinet Gramophone, with electrical pick-up, and an equally handsome

Compactom Wardrobe in oak, to Capt. Harold A. Berry, on his promotion to be District Manager, North Eastern District, and consequent departure to York.

The presentation was made by the Controller, Mr. W. H. U. Napier, C.B.E., and was attended also by the Deputy Controller, Mr. M. C. Pink, and the Assistant Controller, Mr. H. Dive, M.B.E. Mr. Napier gave an interesting account of his associations with Capt. Berry, and his impressions of his work and worth as an officer of the Department and as an official of the Traffic Officer's Association. Mr. Pink followed with his personal recollections of Capt. Berry since the early days of the formation of the L.T.S., up to his more recent activities as Superintendent in Charge of the Trunk and Toll Exchanges, and finally as officer responsible for the Headquarters' section, dealing with matters affecting the equipment of those Exchanges. Mr. Dive rounded off the generally expressed tributes with a few apt remarks in his own inimitable style. Each of his official chiefs agreed in giving expression to the general feeling as to the sterling qualities of "Harold" as a Traffic Officer, an Associationist, and a man. The speeches were excellent, both in matter and compass, the references to Capt. Berry's distinctive narratory and descriptive abilities being particularly well received.

The recipient suitably responded in characteristic though slightly subdued vein. Modestly disclaiming any title to be regarded as a superman, his reply, in its naturalness and directness, was typical of the man. His own account of his early experiences, and progress through the years of telephone development, was photographic in its clearness, with just that touch of humour appropriate to the occasion.

The presentation was well attended, representatives of all branches of the L.T.S. and of the Exchanges with which Capt. Berry has been associated, being present. An old friend in Mr. H. G. Trayfoot, of the Secretary's Office, was also welcomed. The North Eastern District is to be congratulated on its luck in having Capt. Berry as its District Manager, as the staff there will quickly discover for themselves. We shall miss him in many ways, and the good wishes of all go with him into his new sphere of activities.

Retirement of Miss H. Hill.

Jan. 1 saw the last official appearance of Miss H. Hill, Chief Supervisor of Speedwell Exchange, at a gathering at that Exchange of her friends and colleagues, when she was presented with cheques from the Speedwell staff, and others of her old colleagues throughout the whole Service—Miss Hill had previously been the recipient of an easy chair from old friends at the Riverside Exchange.

Miss A. Cox, M.B.E., Female Superintendent, who made the presentations referred to Miss Hill's qualities, among them the enviable one of keeping her staff efficient and happy. Other speeches not only testified to her faithful service, but were in such affectionately appreciative vein as to leave Miss Hill in no doubt of the real regard in which she was held by all with whom she came in contact.

Occasions such as these are always sad, and leave gaps which are difficult to fill, but we all wish Miss Hill continued health and zest to enjoy her well-earned leisure.

Obituary.

It is with very deep regret that we have to record the unexpected death of Mr. W. Bevan, Executive Officer of Contract Branch Headquarters. He died very suddenly at the early age of 44 from pneumonia. On the Friday before his death on the following Thursday, he was at the office apparently in good health, and many of his friends were unaware of his absence.

Mr. Bevan joined the Ex-National Telephone Company on Nov. 5, 1900, and was appointed a Clerk in May, 1903. In November, 1913, he was transferred to the London Telephone Service from the Engineers, and was promoted to the rank of Executive Officer in November, 1923. He joined the Contract Branch Staff in May, 1925, and was in charge of the Private Wire and Government Services sections.

It will be recalled by many in the London Telephone Service that his unfortunate widow was, before her marriage about three years ago, employed as a Clerical Officer in the Accounts Branch. To his wife and family we extend our sincere and deepest sympathy.

Personalia.

Retirements.

Assistant Supervisor, Class I.

Miss C. Hill, of Speedwell.

Resignations on Account of Marriage.

Telephonists.

Miss V. J. Thorne, of Avenue.	Miss E. G. Holdaway, of North.
" D. A. Chilcote, of Bermondsey.	" R. M. Wright, of North.
" D. A. Elliott, of Bishopsgate.	" M. Croombes, of Regent.
" D. Chandler, of City.	" I. D. Franklin, of Sydenham.
" C. I. Harding, of City.	" B. F. Tibble, of Toll A.
" D. K. Richardson, of Fulham.	" M. Dixon, of Toll A.
" M. E. Chappell, of Greenwich.	" A. Perry, of Victoria.
" D. R. Upton, of Hampstead.	" E. J. Skinner, of Victoria.

Miss P. M. Smith, of Holborn.	Miss M. J. Dunkeld, of Waterloo.
" I. A. Archer, of Holborn.	" E. D. West, of Popesgrove.
" C. D. Rackham, of London Wall.	" D. R. C. Smart, of Central.
" W. Smith, of Mayfair.	" H. B. Martin, of Central.
" I. A. White, of Museum.	" E. N. Freestone, of Chiswick.
" J. W. Gordon, of National.	

GLASGOW TELEPHONE NOTES.

Glasgow Post Office War Hospitals Entertainments Committee.—The sixth entertainment of the season was given, by the staff of the Douglas Telephone Exchange on Monday, Jan. 12, Miss Tulloch, Supervisor, presiding. As the "fitting" from Bellahouston took place on the 10th inst., our social was in the nature of a "house-warming," and there is no doubt that it filled the bill.

Col. Gourlay, Medical Superintendent, and Mrs. Gourlay, were present throughout the evening, which commenced at 7.30 with whist. After a break for tea at 9 o'clock, the entertainment took the form of a Social. Through the generosity of the Hospital officials, a band was in attendance to discourse music during whist and the latter part of the programme. When the leader of the band put up "I'm Dancing with Tears in my Eyes" for the final number, I wonder if he realised how near the truth he came.

Col. Gourlay, in thanking the company for providing the entertainment, said that he was pleased that it had fallen to the Post Office to provide the first at the Combined Hospitals, and he said that he had to go back many years to remember a show which would stand comparison with that evening.

On (the Dangers of) Procrastination.

I am as prompt as a clock, if I only know the day a thing is wanted—otherwise I am a natural procrastinator.—(*Twain.*)

Irresolution and procrastination in all a man's affairs are the natural effects of being addicted to pleasure.—(*Spectator.*)

Up to my chamber all alone, and troubled in mind to think how much of late I have addicted myself to expense and pleasure, that now I can hardly reclaim myself to look after my great business, till it is now almost too late. I pray God give me grace to begin now to look after my business, but it always was, and I fear will ever be, my foible that after I am once got behind with business, I am hard set to it again to recover it.—(*Pepys.*)

Delay means more fees to the lawyer.—(*Bennett.*)

Be wise to-day; 'tis madness to defer;
Next day the fatal precedent will plead;
Thus on, till wisdom is push'd out of life.
Procrastination is the thief of time;
Year after year it steals, till all are fled,
And to the mercies of a moment leaves
The vast concerns of an eternal scene.—(*Young.*)

Where's the good of putting things off? Strike while the iron's hot.—(*Hugh in "Barnaby Rudge."*)

The Americans have devised a system depending on the use of cards with the words "Do it now" printed on them in bold type, which are intended to be placed as reminders full in the line of sight, in order to overcome indolence, apathy, or procrastination.—(*Bligh.*)

Tomorrow is the day, which procrastination always promises to employ and never overtakes.—(*Observer.*)

We will instantly proceed to action, for there is always danger in delay.—(*Don Quixote.*)

'Tis clear if we refuse
The means so limited, the tools so rude
To execute our purpose, life will fleet,
And we shall fade, and nothing will be done.—(*Browning.*)

The person who deliberates sufficiently before taking every step will spend his life standing upon one leg.—(*Kong ho.*)

Miss not the occasion; by the forelock take
That subtle Power, the never-halting time,
Lest a mere moment's putting off should make
Mischance almost as heavy as a crime.—(*Wordsworth.*)

Nothing wastes time like miscalculation.—(*Hamerton.*)

As Shakespeare says, if you are going to do a thing, you might just as well pop right at it and get it over.—(*Jeeves.*)

Like a star, unhasting,
Unresting, be each one
Fulfilling his God-given hest.—(*Goethe.*)

Money is hundred-footed; upon perceiving a tael lying apparently unobserved upon the floor, do not lose the time necessary in stooping, but quickly place your foot upon it, for one fails nothing in dignity thereby; but should it be a gold piece, distrust all things, and, valuing dignity but as an empty name, cast your entire body upon it.—(*Kai Lung.*)

LIVERPOOL DISTRICT NOTES.

Retirement of Mr. Frank Ellinson, Engineering Inspector.—Mr. Frank Ellinson retired from the Service in which he has been employed since 1884, first with the Lancashire and Cheshire Company and subsequently with the National Telephone Company and the Post Office, on Dec. 31, 1930. The whole of Mr. Ellinson's official career has been spent in the Liverpool District. On Jan. 9 he was entertained by his colleagues at a Smoking Concert presided over by the Sectional Engineer, Mr. C. Brocklesby, M.I.E.E., during the course of which he was presented with a wallet containing Treasury notes.



MR. FRANK ELLINSON.

Mr. Ellinson, in response to the many valedictory speeches and returning thanks for the presentation, recalled the names of many of the earlier pioneers of the telephone business with whom he had been associated in his long and faithful service, names which once loomed large in the telephone world and now almost forgotten except when called to mind on occasions such as this.

The Dramatic Season is now in full swing, and, as is to be expected, many members of the Telephone Staff are connected with various dramatic organisations. On Monday, Jan. 5, the Carlton A.D.S. presented "Lady Windermere's Fan" at the Beechcroft Little Theatre. Out of a caste including eleven female characters, eight were portrayed by Post Office telephonists, three of whom took the leading parts. The *Birkenhead News* said that



LADY WINDERMERE'S FAN.

Centre: Miss Ruby Copeland (Mrs. Erylne).
Right: Miss Edna Holgate (Lady Windermere).

"among the best performers one had no hesitation in selecting Miss Edna V. Holgate as Lady Windermere, her acting being marked by delicacy and a delightful expressiveness. Miss Ruby Copeland gave a distinguished portrayal of Lady Erylne, her acting being full of deep understanding and intelligence. . . . The work of Miss Nell Hughes as the Duchess Berwick . . . had a freshness and aplomb that was distinctive and praiseworthy."

Miss Holgate is employed in Birkenhead Exchange, Miss Copeland and Miss Hughes at Bank and Central Exchanges respectively.

The photograph is by Wm. Cull, Birkenhead.

William Marshall Simpson, C.B.E.—On Dec. 31, 1930, Mr. Simpson relinquished his office of Postmaster-Surveyor of Liverpool.

Members of the staff were given an opportunity of taking a dish of tea with Mrs. Simpson and bidding farewell to their retiring chief at an informal gathering at the Head Post Office. Opportunity was taken at this gathering by Mr. Simpson to introduce his successor, Lt.-Col. Kempe, M.C., who was cordially welcomed by all present. On Jan. 16 a well attended gathering of all sections of the staff assembled for a final leave taking and presentation to Mr. Simpson to mark the respect and affection of the staff with which he had been so long associated. The presentation took the form of an ivory and silver fitted dressing case, and to Mrs. Simpson was presented a diamond jewelled wrist watch.

Unfortunately, on the morning of the presentation, Mr. Simpson was laid low by an attack of the prevalent influenza and forbidden by his physician to leave his bed, but Mrs. Simpson very amiably deputised for him at the ceremony. The presentation was preceded by an excellent concert given by members of the staff. Vocal numbers were rendered by Miss Gwendoline Jones, Miss Florence Lewis, Mr. James Hawitt, and Mr. Leonard Robinson; humorous items by Mr. T. Lennon and Mr. J. Harris-Green. The accompanist was Miss Nora C. Lewis.

The presentations to Mr. and Mrs. Simpson respectively were made by Mr. Pickering, the Assistant Postmaster, who also occupied the chair, and Miss A. Jordan, who conveyed the good wishes of the staffs in the different branches, and were supported by a number of speakers, including Lt.-Col. Kempe and Mr. Gauntlett, the District Manager.

We all hope that Mr. Simpson will quickly recover from his indisposition and be quite fit before he starts on his projected journeyings in foreign lands.

BIRMINGHAM NOTES.

Retirement of Mr. J. W. Wilkinson.—The members of the Traffic Staff and representatives of the Accounts and Contract Sections met on Dec. 22 last to say "Good-bye" to Mr. Wilkinson, Traffic Superintendent, Class II.

The presentation of a Westminster chime clock and an arm-chair was made by Mr. J. L. Parry, District Manager, who, together with various members of the company, voiced the high regard with which Mr. Wilkinson was held by the staff. Mr. Wilkinson, in appropriate terms, thanked the staff for the presentation and for their good wishes.

We are pleased to welcome Mr. G. F. Findley, who has been transferred from the North Midland District, to succeed Mr. Wilkinson.

The Accounts Section.—The second of the series of meetings arranged for the Accounts Section was held on the evening of Jan. 5 last under the chairmanship of the District Manager, Mr. J. L. Parry.

The paper was given by Mr. H. L. Halward, Clerical Officer, on the work of the Ledger Branch. It was a most instructive paper and was keenly appreciated by a large and enthusiastic audience, which included officers from the Traffic and Contract Sections.

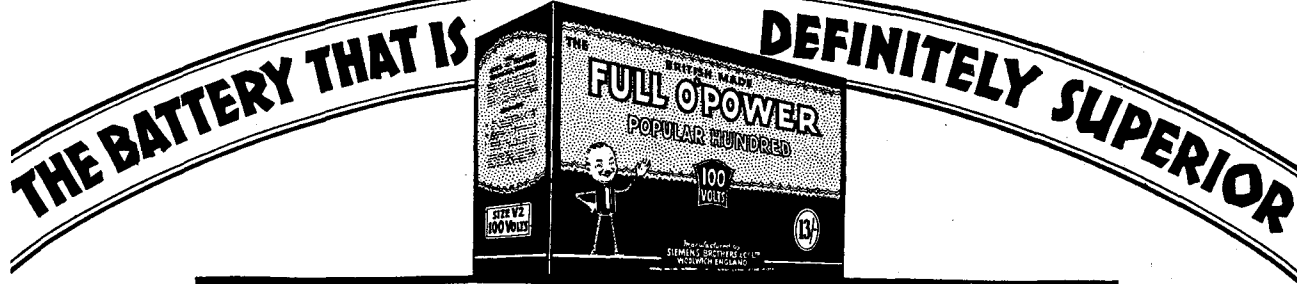
Birmingham Telephones Lecture Society.—Another large gathering on Jan. 14 last testified that the appreciation of the staff in the efforts which had been made to familiarise them with automatic conditions has not diminished as a result of Christmas festivities. On this occasion the paper was by Mr. K. W. Mills, Assistant Traffic Superintendent, on "The Operations and Functions of the 'Director.'" The lecture was illustrated by lantern slides, and was so arranged that it was a continuation of the previous papers on automatic working. Mr. Mills is to be congratulated on the manner in which he dealt with his subject, and the number of pertinent questions he was called upon to answer at the close was evidence of the appreciation and interest of the audience.

The lecture was followed by a concert, given by the members of the District Manager's Clerical Staff. It included songs, quartettes, and a sketch, and the enthusiasm shown by the audience was a fitting reward for the efforts of the artistes. A short dance terminated a wonderfully successful evening.

Our thanks are again due to the Postmaster-Surveyor, Lt.-Col. W. T. Brain, who presided and, as on previous occasions, contributed largely to the success of the meeting, and to Mr. A. G. Cooper, Assistant Traffic Superintendent, who was responsible for the installation of amplifiers and loudspeakers, without which it would be almost impossible to hold these lectures in their present form.

LEEDS DISTRICT NOTES.

Leeds P.O. Messengers' Concert.—The Annual Concert and Prizegiving of the Telegraph Messengers' Institute was held in the People's Hall, Leeds, on Jan. 14, and it was the universal opinion that this year's function outshone even last year's successful effort. The excellence of the concert was eloquent of the wealth of musical and humorous talent which exists amongst the staff. Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster Surveyor) was in



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the chair, and a distinguished platform party included Mrs. Jayne and Miss Jayne, Col. and Mrs. Bray, Col. Hobbins (Surveyor, N.E. District) and Mr. Tatlock (Office of Works). The prizes were presented by Mrs. Jayne after Col. Jayne had made an amusing little speech in which was wrapped up some good advice to the messengers and their parents. Suitable acknowledgment of the services of all who had contributed to the success of the evening was made by Mr. Mansell (Chief Supt., Telegraphs), who is Chairman of the Institute.

Promotions.—We extend a hearty welcome to the district to our two new Traffic Supts., Class II, Mr. J. R. Batchelor and Mr. C. A. G. Salmon. Mr. Batchelor, who is no stranger to the Leeds District, has been promoted from the Norwich District, whence reports reach us of his rivalry with "Percy Flage," and his penchant for opening Rural Automatic Exchanges almost every other week.

Mr. Salmon, promoted from the Chester District, is not quite so well known personally in Yorkshire telephone circles, but his enthusiastic and unremitting efforts as Honorary Secretary of the Telephone Traffic Officers' Association (Provinces), have rendered him deservedly popular amongst Traffic Officers generally.

On the Engineering side, our congratulations and a hearty welcome are tendered to Mr. C. E. Morgan, who has been appointed Executive Engineer at York, and Mr. J. C. Denton on his promotion to be Staff Officer in the Superintending Engineer's Office at Leeds. Mr. Morgan comes to us from the South Lanes. District Technical Section, and Mr. Denton was previously Higher Clerical Officer in the Superintending Engineer's Office at Cambridge.

Mr. H. C. France, Traffic Supt., Class II, has been transferred to a similar post in the Guildford District and takes with him our best wishes for his success and happiness in his new district. Mr. France was with us for approximately six months only, but has left behind a lasting impression of an efficient officer and an engaging personality.

Retirement of Mr. S. A. Pickering.—On Dec. 31, 1930, Mr. S. A. Pickering, Staff Officer, in the Superintending Engineer's Office, retired, under the age limit, after completing more than 45 years' service. Unlike many officers of the P.O. Engineering Department, Mr. Pickering was fortunate in being able to spend the whole of his official career at Leeds. He commenced as a telegraphist at the H.P.O. in 1885, but was transferred as a clerk to the Engineering Department in 1894, and after passing through the various clerical grades became Senior Clerk (now Staff Officer) in December 1901.

At a social evening held at the Guildford Hotel, on Jan. 13, he was presented with a coffee-pot and a tea-pot in silver from the staff of the

district, as a token of the esteem in which he was held. The chair was taken by Mr. J. W. Atkinson (Superintending Engineer), who was supported by Mr. J. Shea (Asst. Suptg. Engineer), Mr. H. E. Ashton, Capt. J. E. Fletcher, and Capt. F. A. Linsell, M.C. (Executive Engineers), and Mr. J. C. Denton (Staff Officer). The gathering was representative not only of the whole staff but also of those who during the past few years have preceded Mr. Pickering to the ranks of the official "unemployed."

The Chairman and a number of speakers testified to Mr. Pickering's efficiency and to the courtesy and tact which had been exercised by him during his long official career. The formal presentation was made by Mr. J. R. Harcastle (Higher Clerical Officer) after which Mr. Pickering suitably responded. An interesting and varied programme occupied the remainder of the evening and the efforts of the artistes were greatly appreciated.

Sports Items.—The Leeds P.O. Mixed Swimming Club terminated a successful winter season on Jan. 23. So successful has it been as a mixed club that it has been decided to run a Mixed Summer Club during 1931.

The Leeds P.O. Football Team continues in good fettle, and this season's record to date registers 8 matches won, 3 drawn, 5 lost; goals for, 46; goals against, 34. In the 1st round of the Lancashire and Yorkshire Cup, Bradford P.O. were beaten at Leeds by 3—1. The 2nd round was versus our unbeaten opponents in past cup-ties, Sheffield P.O. Engineers, and resulted in draw, 1 goal each. The replay will be at Leeds in the near future.

Obituary.—It is with deep regret that we have to record the death, in his 61st year, of Mr. R. Alexander, Asst. Superintending Engineer, N.E. District, Leeds, which took place suddenly—due to heart failure—at Dunbar, on Saturday, Dec. 27, 1930. While spending the Xmas holiday at that town, where he contemplated taking up residence on his retirement in August next, he was taken ill on the Saturday morning and passed away later in the day.

Mr. Alexander entered the P.O. Service as a telegraphist at Edinburgh in October, 1885, and transferred to a clerkship in the Engineering Dept. in that city, in March, 1888. In January, 1903, he was appointed a 2nd Class Engineer in the Engineer-in-Chief's Office, London, and held that position until 1911, when he returned to Edinburgh as 1st Class (now Executive) Engineer. In August, 1928, he was promoted to be Asst. Superintending Engineer at Leeds.

Mr. Alexander was of a genial and kindly disposition, and the news of his death came as a great shock. The deepest sympathy of the whole staff is tendered to Mrs. Alexander and family in their sad loss.

RETIREMENT OF MR. F. W. TAYLOR, OF BRIGHTON.

PRACTICALLY 44 years' service is the record of Mr. F. W. Taylor, of Brighton, District Manager of Telephones, whose retirement at the end of last year, at the age of 62, was the occasion of farewell presentations on Dec. 20.

It was about the year 1886 that Mr. Taylor entered the service of the United Telephone Company, in London. In 1890 this company was taken over by the National Telephone Company, and in 1894 he became District Manager at Reading. His district extended from Southend to Marlborough, and from Dorking to Bedford, and at that time comprised only four exchanges. Now it is divided into four separate districts. In 1904 he came to Brighton, at a time when the Brighton Corporation telephone system was in competition with the National Telephone Company, to which the Corporation sold its undertaking in 1906; and in 1908 he went to Manchester, to deal with the division of the Central Exchange into two exchanges. In 1912, the Post Office took over the National Telephone Company's system, and he went to Birmingham, returning to Brighton in 1921. In that year there were 20,000 subscribers in the district, whereas to-day there are 64,000.

At the presentation ceremony, Mr. A. Lumsden (District Traffic Superintendent) presided, and the presentations were made by Colonel T. Kelly, C.M.G., the Surveyor of Post Offices, Telegraphs and Telephones for the south-east of England. Among those present were: Mr. F. C. Tansley (Head Postmaster of Brighton), Mr. A. J. S. Merchant (Head Postmaster of Worthing), Major Headley (Head Postmaster of Eastbourne), and Mr. E. T. Thorpe (Assistant Head Postmaster of Brighton).

C.T.O. NOTES.

Promotions.—Messrs. W. H. Hebron and W. K. Ware, Assistant Superintendents to Superintendents (Lower Grade); Messrs. A. H. Rudderham, G. J. Defoe, A. P. Orange, C. H. Badderly, J. H. Roebuck, Overseers to Assistant Superintendents; Messrs. A. J. Sander, E. C. Garrett, W. C. Barnett, A. F. Bunker, A. J. Scottney, C. S. Hulls, Telegraphists to Overseers; Miss F. M. Brown, Assistant Supervisor to Supervisor (Telegraphs); Misses C. M. Kilsby, E. M. West, M. A. Larkin, B. A. Thurlow, E. M. Midwinter, A. E. Wilson, and A. F. Gilbert, Telephonists to Assistant Supervisors (Telephones).

Retirements.—Messrs. T. H. Brookes, and J. H. Mitchell, Superintendents; C. E. Daggett and C. R. Goater, Assistant Superintendents; A. E. Bennell and A. W. Whight, Overseers; W. J. Jones and E. C. Youle, Telegraphists. The following have retired on account of ill-health: Miss M. J. Reid, Supervisor; Messrs. J. Kench and C. Nicholson, Telegraphists.

Obituary.—We regret to record the death of Mr. V. C. Castelli at the age of 45. He was a well known personality in the Cable Room, and to his widow, who was one of ours, we extend our deepest sympathy.

The death is announced of Miss C. A. Dorrington. For many years, although she had indifferent health herself, she was a devoted nurse to her brother, whose death, which preceded hers but a very short time, no doubt had some effect upon her. To her relatives we extend our sympathy.

C.T.O. Veterans.—The programme for 1931 is as follows:—

- Mar. 13—Annual Dinner at Andertons Hotel at 6 p.m., Tickets 5s.
- May 7—Kew Gardens, 4 p.m.
- May 19—Visit to Gramophone Company, Hayes. Tea provided. Ladies welcomed.
- June 4—Greenwich Park, 4 p.m.
- July 9—Visit to Chiswick. Products factory. Tea provided. Ladies welcomed.
- Aug. 13—Kew Gardens, 4 p.m.
- Sept. 3—Visit to Shredded Wheat Factory, Welwyn. Tea provided. Ladies welcomed.

The Secretary is Mr. C. O. Viveash, 7, Ellaline Road, W.6.

Sports.—Cross Country.—The C.T.O. teams performed creditably in the Civil Service Cross-Country Championship decided over a 5-miles course.

The first C.T.O. man home was Mr. A. C. Tyrrell—9th place. The team place was 4th with 96 points. The C.T.O. "B" team won bronze medals in the Novice team class.

C.T.O. Art Society.—Fifth Annual Exhibition.

Although smaller, the fifth annual exhibition of the above Society was not, in the opinion of many visitors, inferior in quality to its preceding shows. In fact, according to the views of competent critics, evidence of a big stride forward, particularly in the water-colour section, existed.

The chief painting prize, "The Sidney Justins Memorial Award" was won this year by Mr. Davey. The winning picture "Stanton" was a clean, directly painted and sunny sketch of this picturesque Cotswold village.

Mr. J. C. Osborne attracted attention with his very clever exhibits—water colours, black and white and poster designs. Although just failing to gain the chief award, Mr. Osborne took the "Visitors' Vote" for the best work both in the painting and black and white sections. Mr. A. J. Ginger gained second prize for painting, with his small oil "Winter Sunshine." Miss N. E. King took Mr. D. M. Ford's special prize for painting with her attractive and brilliantly treated flower and still life picture "Chinese Lanterns."

Miss M. Gooding gained first prize and also a certificate for excellent pieces of work in the Needlework Class.

Mr. C. Young took first prize in the Craft Section for his collapsible chess-board table. Miss I. Hood showed a finely executed fire screen of woodwork and worked leather, which incidentally gained for her the "Visitors' Vote" preference.

Miss F. E. King again attracted attention with her admirable nude model in clay, "Eve."

The Photographic Exhibits were notable for an advance on last year's show.

Mr. H. J. Keenor's "Morning in the Harbour," a splendid print indicating the artist behind the machine—gained the "Bigmore Award." Mr. F. H. Rayns was a notable exhibitor and gained second prize and several certificates with foreign subjects. A study of a post-impressionist painter engaged on his "jazzy" picture gained for Mr. Rayns a prize. "Schulekamaraden" and "St. Bartholomew's Church, Konigsee" were other fine prints by Mr. Rayns.

Mr. G. H. Ross gained the Controller's special prize with an excellent skyscape—rolling cumuli over dark uplands. Miss L. M. Riches' "Summer" and Mr. J. F. Smith's "Gruyeres" were first-class prints worthy of awards. Mr. L. P. Schlarb, Mr. H. Bartlett with his "Hampton Court Gateway," Mr. Lawrence and Mr. T. Adams were other notable exhibitors.

The contact print section had a good show of well executed prints, the best being those of Miss Middleton, who easily gained first prize.

FOR OUR ADVERTISERS.

ALL enquiries should be addressed to the Department of Overseas Trade, 35, Old Queen Street, London, S.W., quoting reference number in all cases. Supplies, &c., required by:—

Australia.—Melbourne. P. and Telegraph Dept., Feb. 10. Telephonists' telephones for common battery working (A.X. 10569). Also same department, Feb. 17. Supply of electric lamps, lamp caps, and sockets for voltages from 4 to 50 (A.X. 10643). Also same department, Feb. 24. Supply of resistances in vitreous spools ranging 100 to 4,000 ohms. (A.X. 10642). Also same department, Mar. 17. 80 miles rubber-insulated cotton-covered twisted conductors (A.X. 10697). *South Africa.*—Johannesburg Railways and Harbours, Feb. 16. Material for colour light railway signalling (A.X. 10662). Durban, Feb. 20. Corporation traffic control signals (A.X. 10687). *New Zealand.*—Wellington. P. & T. Dept. Mar. 3. Carbon diaphragms for telephone instruments (A.X. 10507).

A confidential report on the market for electrical contractors supplies in Siam has been prepared by the D.O.T. based on information supplied by the British Consul-General at Bangkok. United Kingdom firms desirous of receiving a copy, together with particulars of the Special Register service of information, &c., should communicate with the Department, as above, quoting Reference No. A.X. 10454.

Similarly a report on electrical developments in Algeria has also been prepared by the D.O.T. from information supplied by the Acting Consul-General at Algiers. United Kingdom firms requiring a copy of same should also apply to the Department and address above. In this case quoting Reference No. A.X. 10450.

N.B.—The coming into force of the duty on valves for wireless telegraphy and telephony upon importation into Australia has been further postponed until July 1, 1931.

J. J. T.

THE Telegraph and Telephone Journal.

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MARCH, 1931.

No. 192.

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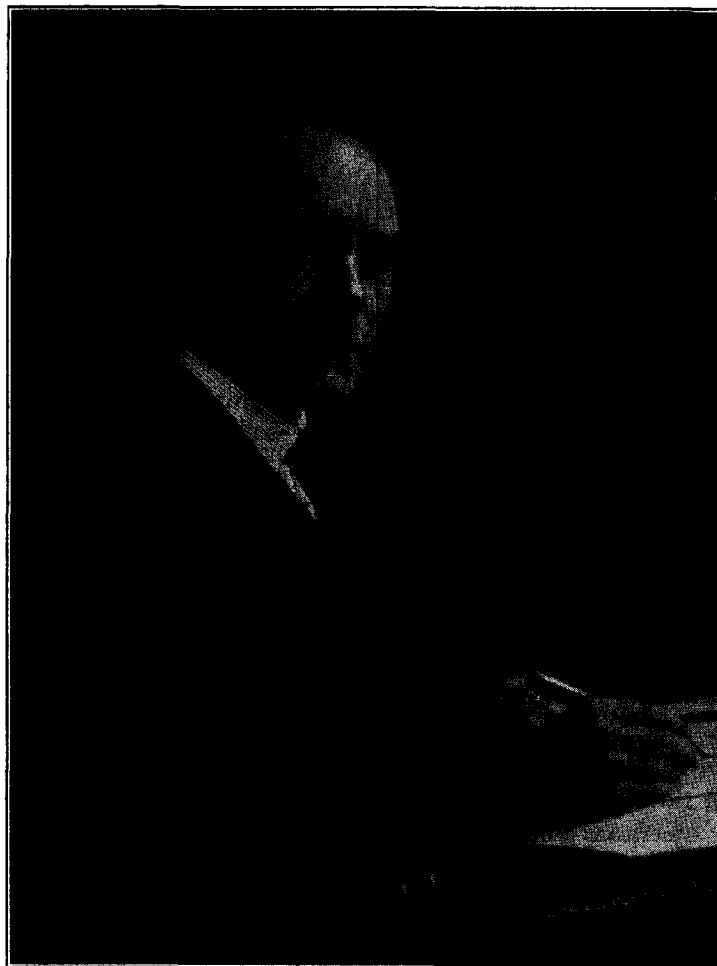
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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXXIV.—LT.-COLONEL W. T. BRAIN.

COLONEL BRAIN, the Postmaster-Surveyor of Birmingham, has touched Post Office life at so many points that no apology is needed for presenting him to our readers, though his direct contact with telegraph matters was interrupted for many years by the duties of postal administration. He was born on Sept. 14, 1871, and came of Post Office stock, a tradition which is, we understand, being continued in the person of one of his own children. He joined the London Postal Service in August 1886 as a telegraphist, and he was for long employed at the telegraph office which was formerly maintained by Post Office staff on the platform at King's Cross Railway Station. In early days he took his share in the work of the staff associations and attended several conferences. He joined the L.P.S. Clerical Staff in June 1896, and quickly made a name for himself. He was for some time the personal clerk of a late Controller, Sir Robert Bruce, C.B. By September 1920 he had become a Higher Grade Superintendent, and thereafter his progress was very rapid. He was Chief Superintendent



[Portrait by Lafayette Ltd.]

in April 1922, Assistant-Controller (E.C.) in March 1926, and Postmaster-Surveyor of Birmingham in November 1927. In his later duties he has again had close personal dealing with the telegraphs at the offices under his control; and his early experiences in the London Districts and in the Controller's Office, L.P.S., have provided him with ready and sympathetic insight into the work and problems of the telegraph service. For many years he was connected with the Volunteer movement, and during the war his services were regarded as extremely valuable in the organisation of the Army Posts, and he rose to high position. Since the inception of the Civil Service Sports Society he has given that movement important service; and he is, in addition, well known in the Post Office world as having been a secretary and being now a trustee of the "Northampton" Insurance Society. Colonel Brain's record is one of long-continued and devoted service to the interests of his colleagues, and we are happy to be able to include him in our Gallery and to congratulate him upon the retention of health and vigour.

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVII.

MARCH, 1931.

No. 192.

THE WORLD'S FLUCTUATING DEVELOPMENT.

THE United States with over 20 million telephones, Germany with three million, and Great Britain with two million, are, as is widely known, the three principal constituent countries in providing the total of 35 millions at present existing in the world. Returns are now to hand of their progress in 1930, and the figures certainly reflect the trade depression which was so widespread during that year. We may, however, derive some small consolation from the fact that British telephone development suffered far less than that of the other States. Whilst we added 109,779 telephones to our total (an increase of nearly 6%), as against 127,000 in the previous year, Germany added only 59,735 (an increase of less than 2%), as against 231,000 in 1929, and the United States, according to *Telephony*, about 132,000, as against 865,000 in the year before—an increase of 0.65%. It is clear from this that in 1930, for the first time for many years, the world will have failed to increase its total by a million and a half telephones, and indeed, only if the returns from the other chief telephone-using States show that they have maintained their usual development in 1930, will it be found to have reached a million. It may be that, Micawber-like, the telephone world is retiring in order to spring. Telephone development is always subject to considerable fluctuation, due to political, economic and other causes, and countries which fall below their usual average one year often regain it in the next, but a falling off in the increase of over three-quarters of a million in two States alone is unprecedented. Americans would no doubt be the first to dispute that their country is reaching saturation point in telephone development, but with an average of one

telephone to every six inhabitants, whether man, woman or child, it must be difficult to continue the gigantic figures of annual growth to which we have become accustomed. In this country and Germany, there is plenty of room for development, and it is to be hoped that better trade conditions may ensue in 1931 and facilitate an improvement not only on last year's figures, but on those for normal years. At any rate, the British Post Office, in addition to its usual canvassing activities, is taking special steps to ensure increased publicity by posters, post-cards and illustrated leaflets, and is certainly "all out" to obtain the largest possible number of new subscribers in the coming year.

HIC ET UBIQUE.

THE Prince of Wales, who arrived at Santiago de Chile on Feb. 21, spoke on the telephone the following afternoon from the British Embassy, Santiago, to His Majesty The King at Buckingham Palace. The call was routed by land telephone line over the Andes to Buenos Aires, whence it passed over the commercial wireless telephone link direct to the Post Office receiving station at Baldock, and thence by way of the London Trunk Exchange to Buckingham Palace. The King's voice travelled back via the Post Office wireless station at Rugby to Buenos Aires, and thence by land line to Santiago. Conversation was carried on easily for some minutes.

The length of the wireless link from Rugby to Buenos Aires is about 6,000 miles, and the distance from Buenos Aires to Santiago is about 1,000 miles.

The normal time difference between London and Santiago is 5 hours—i.e., 7 a.m. in Santiago is noon in London. Chile is now, however, enjoying "summer" time, and the difference is, therefore, reduced to 4 hours; and as the King's call took place at 2.15 p.m. British time, the Prince was speaking at 10.15 a.m. local time.

The number of motor vehicles in Great Britain and Northern Ireland (excluding motor cycles) at the end of 1930 was 1,560,275, an increase of 100,543, or 6%, for the year. It is worthy of remark that there are roughly 4 telephones to every 3 cars in this country, whilst in America there are about 3 telephones to 4 cars.

Paragraphs in the Press state that the Japanese Government is about "to transfer the management of the commercial side of the national telephone system to private hands." As we also learn that the Ministry of Communication "will continue to own the exchanges," we are not clear what is to happen. We are informed that the transference is a preliminary to an intensive ten-years' campaign during which every method of commercial salesmanship will be employed to increase the number of telephones in use by half a million. One important step will be the abolition of the installation fee, a very high one in Japan, the only exception being a fee for specially urgent installations.

A similar transfer of the management of the telegraph service is also being considered.

The Newcastle press seems to have given an appreciative "send off" to the telephonists who are being distributed amongst other exchanges on the introduction of the automatic system in the city. Pictures and paragraphs of their final gathering and

dance have abounded, and a humorist in the *Newcastle Journal* concludes his lament thus:—

Miss Number Please has been a good friend, and has given good service. I insist, no matter what "Pro Bono Publico" and "Irate Business Man" may write to the contrary in the Press.

She has been more than a friend; she has been a pal with a fine appreciation of a man's innate cussedness in the morning when the office boy is under his feet all the time and business is going to blazes.

One could be as offensive to her almost as to one's wife before she would make report to the supervisor—a pleasant enough official in her way, no doubt—and in these trying times it is a blessing to be able to be offensive to someone who officially, under divers pains and penalties, is forbidden to answer back.

Well, I personally wish Miss Number Please the best of good fortune. May she win the husband she deserves or get an even better job!

H. H. H.

Our recent editorial on the rural exchanges opened at places "known only to the topographer and the antiquary" drew references from *The Times*, the *Evening Standard* and other papers. It was reserved, however, for an inquiring reporter on the *Daily Mirror* to waste a considerable amount of the time of the London exchange staff, not in making a call, but in experimenting how they reacted to the words "Yardley Gobion" in his thirst for topographical information.

On Feb. 3 last Lord Harris, the only surviving director of the National Telephone Company, attained the age of 80 years. We offer him our hearty congratulations.

LONG DISTANCE TELEPHONY.

J. F. DARBY (*Headquarters Traffic Section*).

(IV.)

To continue the treatment of operating on a trunk signalling basis, a few matters of importance require to be mentioned before the future of this system of working is reviewed.

Accuracy in the timing of calls and the announcement of elapsed time (in the British system subscribers are advised of the elapsed time at 3-minute intervals) is essential in view of the value of long distance calls handled. The importance of correct timing cannot be stressed too much. On one hand, if subscribers are undercharged the revenue suffers and there is less money available for improvements or reductions in charges. On the other hand, overcharging is unfair to subscribers and gives rise to general dissatisfaction. At the present time the calculagraph (a clock device for stamping the time of day and elapsed time) is in common use on trunk signalling positions; it has, however, been definitely decided to replace it by one of the timing devices mentioned in article No. II of January last.

In the case of inter-Continental calls, set up over radio channels, the timing is undertaken by the operator controlling the radio channel; two stop watches are used and continuous monitoring is given. These special steps are taken to ensure that full allowances in elapsed time are made for interruptions and repetitions due to the state of the channel (atmospherics, fading, &c., when such occur); accuracy is very essential in view of the high revenue value and cost to the subscriber for each minute of conversation.

Alternative routing forms part of the procedure in trunk signalling operating; it is, however, definitely less flexible in operation than in the case of 'no-delay' trunk working, in view of the fact that circuits are not multiplied but are under the control of individual operators. The regulations governing alternative routing are, briefly, (a) traffic can only be diverted from the normal

route when the standard permissible delay has been exceeded or the service is interrupted by a breakdown, (b) unless there is a complete breakdown, the delay on the normal route must exceed the delay on the alternative route by 15 minutes, (c) the alternative route must be chosen having due regard to transmission and existing loads—only authorised alternative routes can be used.

In the case of Continental connexions, the alternative routes are classified under the heading *voies auxiliaires* and *voies de secours*. The former are routes which involve the setting up of a call over circuits traversing the same countries (and no others) as the normal route; no question of modifying the apportionment of charges amongst the various countries concerned, therefore, arises. On the other hand, a *voie de secours* involves the use of routes via a country or countries not concerned in the normal routing; in consequence, special accounting arrangements have to be made to credit the correct apportionment of charges to each country concerned. *Voies de secours* are, by international regulations, only used in cases of breakdowns of primary routes.

It may be said that, in view of the restrictions on the use of alternative routes in trunk signalling working, the advantages as regards circuit loading which are reaped under no-delay working are absent to a very large extent under the trunk signalling system.

Attention is now directed to the question of *transmission* efficiency. From a traffic point of view this matter involves the provision of facilities such that conversation between any two points in the international network can be undertaken without undue effort on the part of the subscribers, and without repetitions.

For the purpose of ensuring that such facilities are provided, a transmission standard has been laid down and, if this standard is not exceeded, satisfactory speech should be possible. Until recently the standard in the British inland system has been that equivalent to speech over 35 miles of *Standard Cable*. (Standard cable has a definite technical specification and approximates closely to 20 lb. dry core paper cable.)

The *Standard Mile* unit has now been replaced by the unit of attenuation—the *Decibel* (one-tenth of a 'bel'). The attenuation of a line in bels is defined as the logarithm to the base 10 of the ratio of the power entering the line to the power received at the distant end. When this ratio is 10 to 1, the line has an attenuation of one bel or 10 decibels. It is the unit in use in America, being named after Dr. Graham Bell, the inventor of the telephone. The unit adopted in France and Germany is the *neper* or *decineper*. The attenuation of a line in nepers is defined as half the logarithm to the base *e* of the same ratio—power input to output. Comparing the units mentioned, 1 standard mile = 0.9221 decibels = 1.062 decinepers. The standards in force in the countries mentioned are:—

America	—31 decibels for trans-Continental calls.
25 "	" " medium distance calls (i.e., where direct connexions between zone centres are available).
France	—32.36 decinepers.
Germany	—33 decinepers.

It is probable that a standard of 31 decibels will be adopted by the British Administration to cover international connexions and this should give a higher standard, possibly 25 decibels, for inland connexions.

The attainment of these standards is not arranged by providing circuits throughout the system permanently of such a grade that, when any necessary combination of circuits is set up, the standard is not exceeded, as this would mean that on direct connexions the speech volume would be excessive. It is arranged, however, by providing links between certain classes of switching centres—group centres, zone centres or international *têtes-de-ligne*—of certain definite transmission values and arranging for *cord circuit repeaters* (amplifying devices) to be inserted by the switching operators at intermediate points, when necessary, to bring the over-all transmission up to the standard.

The method in force in the British system for inserting cord circuit repeaters is to provide one or more special positions equipped with special cord circuits having apparatus associated for amplifying speech. A multiple of the trunk circuits arranged for cord circuit repeater connexions, is provided over the positions in question.

Operators handling trunk calls at the intermediate offices have instructions that, on certain switched connexions, repeaters must be inserted and, on such calls, they obtain access to an operator on a cord circuit repeater position via an order wire and ask for a repeater to be inserted, quoting the designation of the two trunk circuits involved. The standard equipment provides that, in such cases, the original switching operator can supervise the call, although the connexion is set up at the repeater position. By this arrangement, a controlling operator does not lose 'control' when a repeater is inserted.

The arrangement in America for the insertion of repeaters is somewhat different. At intermediate switching points, the 'through' positions are equipped with both ordinary and amplifying cord circuits. The responsibility for deciding when the insertion of a repeater is necessary rests with the originating trunk centre; the operator at this exchange requests the intermediate exchange to insert a repeater when the records at her office indicate this to be necessary. Requests received at an intermediate exchange for a connexion 'with repeaters' are complied with by the use of an amplifying cord instead of an ordinary cord at the 'through' position.

Although the use of cord circuit repeaters has proved satisfactory up to a point, it has been the experience, both in this country and America, that the machinery set up cannot always be relied upon to secure the insertion of a repeater in a connexion when one is required; it has, in consequence, been decided in America to provide, in place of the arrangement mentioned, *terminal repeaters* permanently in trunk lines.

When circuits so equipped are connected with other *trunk* circuits the repeaters function and give amplification; on the other hand, when such circuits are connected with local circuits, a device, known as a pad, automatically reduces the transmission to the correct value for terminal calls. This feature has been embodied in the design of the new London overseas exchange.

Mention has been made, from time to time, of 'delay' routes and routes provided on a 'delay' basis. It is desired to give some indication of the basis of provision of trunk circuits comprising such routes.

No formula, for general application, is in force but the practice, as far as the inland routes are concerned, is to provide such a number of circuits as will produce a given output (see table below) in the busy hour with an average delay of 15 minutes.

No. of Circuits per Position.	Paid time per Circuit in Minutes.
4	30
3	33
2	36

(The foregoing applies equally to routes operated by the trunk signalling or special control method—in the case of directly dialled calls, the output is a little higher.) The provision of continental circuits is on a somewhat similar basis; initial circuits to continental *têtes-de-ligne* are provided in order to reduce switchings and to embrace new areas where there is a prospect of developing international telephony—150 paid minutes a day can be considered a satisfactory initial load for a single circuit. Additional circuits are provided as the traffic rises, as rapidly as possible, due regard being paid to the maintenance of satisfactory circuit loads—250 paid minutes a day is, on the average, a full load for a continental circuit.

Initial radio channels are similarly provided in order to extend the field of international telephony.

It has been indicated earlier in these articles that the provision of circuits on a 'delay' basis is less liberal than in the case of 'no-delay' working. The actual difference in the number of circuits required to handle a given volume of traffic depends, however, far less on the standards of delay tolerated than on the efficiency of the operating methods adopted to secure the maximum possible circuit load under any given condition.

It is interesting to examine the actual loading of circuits under the two systems. If the case of working four circuits per position is taken, the output should be 30 paid minutes per circuit in the busy hour. This represents 26 minutes' conversation time, on

LONDON (TRUNK)-BRISTOL (LOCAL) ROUTE.

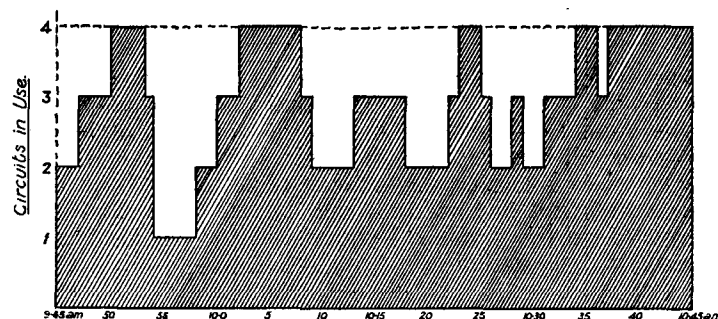


Fig. 1 Busy Hour Period.

the average. If to this figure is added the average proportion of operating time, and time for ineffective calls, an *overall engagement* of a circuit is 40 minutes in the hour, or 66.6%. This gives quite a considerable period when circuits are unoccupied, as can be judged from the charts, Figs. 1 and 2, which show the actual overall occupation of two groups of four circuits, minute by minute, under normal operating conditions, with standard average delays.

It will be seen that, notwithstanding the fact that calls are waiting for completion, circuits are from time to time idle. It is apparent that while an operator cannot maintain four circuits

LEICESTER (TRUNK)-LONDON (TRUNK) ROUTE.

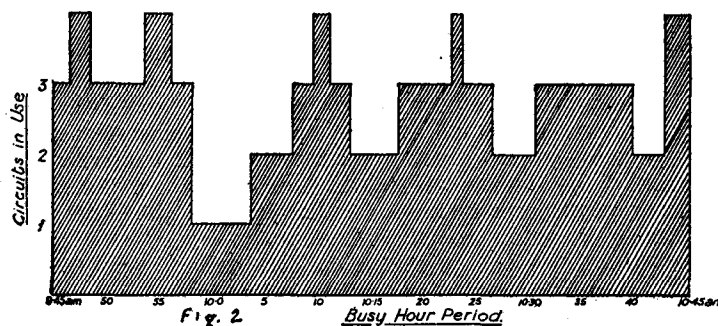


Fig. 2 Busy Hour Period.

fully loaded, there are occasions (due mainly to long-duration calls) when she can fully employ four circuits. One is led to the conclusion, therefore, that if the circuits were in a common group with availability to a team of operators, a greater loading of the circuits could be obtained, providing that aids, such as visual engaged or idle indicating signals to facilitate the seizure of a circuit as soon as it becomes disengaged and clearing signals to indicate complexions, were provided. Further, if by the use of alternative routings, the team of operators using the circuits in question can be increased, an even better loading might be expected.

In order to examine the capacity of a larger group of circuits, a graph has been compiled (Fig. 3) showing the loading minute by minute (from recent returns—the second busiest day in a 14 days' record) as it would have been if the calls were set up approximately at the time they were booked—allowance has been made for the actual durations and ineffective

attempts. The delays which the traffic in question sustained are given by the lower graph. The group consisted of 11 circuits allotted in sub-groups of 4, 4 and 3, respectively, to 3 positions.

It will be seen that the traffic was equal to the capacity of 6.62 circuits, fully loaded, or a percentage occupied time of 60. The resulting output in paid minutes was actually sub-normal; if allowance is made for this, the loading would have been 66%—approximately the figure arrived at from the theoretical considerations above.

Let us now consider the class of service which would have been given if the facilities had existed for the subscriber to have been 'held' and a service attempted on demand (assuming for the moment that the difficulties mentioned earlier relating to signalling, transmission, routing, checking of calling subscriber's number, &c., had been met). In the first place, it would not have been necessary to reverse the call to the *calling* subscriber in most instances and the operating time value of the call would have been lower.

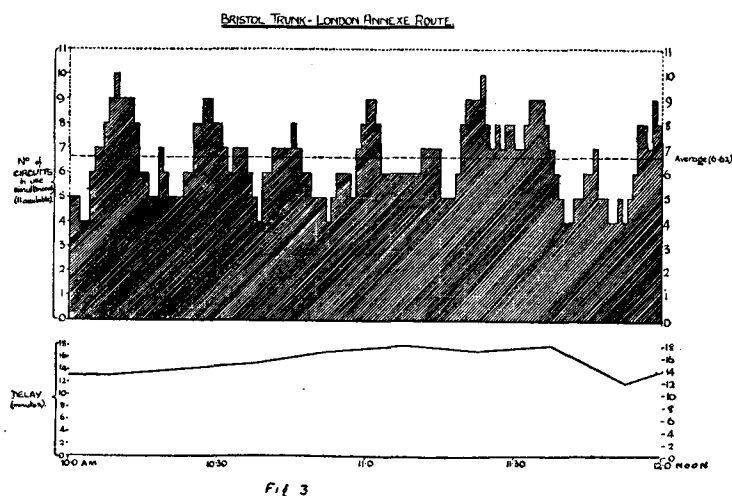


Fig 3

Secondly, it seems clear that the majority of the calls would have been disposed of practically on demand. It would appear, therefore, that, as far as circuit loading is concerned, there is no evidence that the introduction of a system of working on a 'demand' basis calls for any increase in circuits. (It is mentioned that the occupied time on a standard *no-delay* basis for a group of 11 circuits is 59.4%.) On the other hand there is reasonable prospect that an alteration in operating, such as is contemplated, may lead to a greater loading of circuits. In this connexion the American Telephone and Telegraph Company have in force the following standards for circuit loading:—

Number of Circuits in Group.	Percentage Occupation of Circuit.	
1-circuit group ...	76.7	(65 if no alternative routes exist.)
10- " " ...	92.6	
20- " " ...	94.6	

These figures apply to the loading during the busiest month of the year. During non-season periods the figures are lower, corresponding to the difference between the traffic of the 'maximum' month and that for the non-season.

Consideration can now be given to the question of the future method of working for routes provided on a 'delay' basis. It is clearly desirable to provide facilities so that, when traffic conditions permit, a subscriber can be held at the telephone and an attempt made to complete his call.

Arrangements are in hand to effect the necessary modifications in equipment, the basic change being to equip the recording positions with a multiple of outgoing trunk circuits. It will, of course, take some time to bring about a complete change and it will be necessary to deal with the larger centres before attempting to make modifications in rural or semi-rural areas. In London, a suite of

60 combined recording and completing positions (to be known as 'demand' position) have been installed and, in the design of the new continental suite (to be opened in about 18 months' time), a feature has been incorporated to admit of 'demand' working during the less busy periods of the day. The present transatlantic control positions in London have the inter-continental record circuits multiplied upon them and, since December, 1929, an attempt has been made to give a service on demand between London and New York.

In order to meet cases where the circuits available are definitely inadequate to carry the traffic at any time (i.e., the demands on hand exceed the carrying capacity of the circuits) in circumstances such as breakdowns, sudden rises in the volume of traffic, shortage of circuits, or agreement to provide some long distance service on a heavy delay basis, the *special attention* method of trunk signalling operating will be used. (This does not, of course, preclude the circuits from being worked on a 'demand' basis when the traffic falls during the less busy periods of the day.)

The passing of service particulars (e.g., the called subscriber's name and number) and the calling of subscribers in advance, greatly facilitate working when heavy delays are experienced and circuits are controlled singly or in pairs. In this connexion it is mentioned that, for some years in this country, systems of telephone and telegraph order wire were in operation for the passing of service details. With the reduction of permissible delays these systems were abandoned, although, on the transatlantic telephone service, teleprinter order wire working has been in operation experimentally for some time. Telegraph order wire working is in common use in a number of continental countries; in America, when heavy delays are occasioned, through some special circumstances, teleprinter order wire working is commonly resorted to.

In connexion with the question of calling subscribers in advance, opportunity might be taken to mention *re-ringing* facilities which enable a trunk operator to ring (*appel préalable*) a subscriber to inform him that a call is about to mature and then allow him to replace his receiver. The operator, however, can hold the subscriber's line and re-ring (*appel définitif*) him when the call matures. Another somewhat similar aid, which is very useful in completing calls on a 'delay' basis, is the *delayed ringing* facility. This enables a trunk operator to seize the calling subscriber's line (often as an overlap operation) without ringing—the ringing being applied later, when the operator is satisfied that the distant subscriber has been obtained.

These facilities, although available in various countries, on the Continent and in America, are only partly available in the British system. The subject is, however, being investigated at the present time with a view to a general introduction of the facilities throughout the system. With these facilities the output from special attention method should be superior to that under the ordinary trunk signalling method. (Without the re-ringing facility there is a tendency on the part of operators not to call subscribers in advance, with the result that the special attention method merges into the ordinary method.)

The *ordinary* method of trunk signalling working will without doubt continue to be used, mainly as the normal method for disposing of traffic which suffers delay owing to sustained 'no circuit available' conditions under demand working and for completing calls ineffective initially. It will, in effect, be the counterpart of the operating carried out on combined recording and completing positions in forming the complete system for operating on a *demand* basis.

(To be continued.)

HOLIDAYS IN SWITZERLAND.

THE Horsley Party will leave London on Friday, June 12, for ADELBODEN, MEIRINGEN and AXENFELS (5 days at each). 15 guineas. Apply to Mr. J. W. Fewtrell, 48 Frewin Road, S.W.18.

PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

By J. J. T.

(Continued from page 80.)

NOT without excellent reasons does the *Daily Telegraph's* correspondent anticipate serious problems in the future, due to the increasing power of the world's stations.

The German plans include nine high-power broadcasting stations, Muehlacker—already functioning—and Heilsberg (East Prussia), also Langenberg (Rhineland), while the present transmitter at Frankfurt Main is also to be strengthened. New and powerful transmitters, according to the writer's information, are to be built within the regions now covered by the Berlin, Breslau, Hamburg, Leipzig, and Munich broadcasting centres.

The 160-kw. transmitter now in course of erection at Rasin, about fifteen miles from Warsaw, by Marconi—it may probably be in action by the time these lines are in print—will undoubtedly make itself heard throughout Europe. "Already," says the *News-Chronicle* specialist, "the ether of the Balkans is nightly turned into a radio battlefield," with Prague, Bucharest, and Belgrade as the more or less harmless combatants in a bloodless battle. The Soviet intends to build a yet more powerful radio station than any one that at present exists in the world, and, according to the Moscow correspondent of a London daily paper, is specially designed for world broadcasting. Its four masts are to be over six hundred feet high. The prospect is not alluring.

Even on a smaller scale one notes projected increases of power, for example, in Belgium and France. As regards the latter, the Radio Agen station, destroyed by floods nearly twelve months ago, is to be reconstructed, and it is not unlikely that advantage will be taken of the occasion to raise the power here also. *World Radio* understands that at the Beziers station an increase from 0.6 kw. to 10 kw. is to be made very soon, while it is more definitely stated that Radio-Vitus station, in course of removal to Romainville, in the environs of Paris, had already raised its power to 2 kw. at the end of last year; this again is to be further increased to 20 kw. in the coming spring. The ordinary transmissions of this station have already been terminated, and it is worthy of special note that "it is intended to use the transmitter for experimental Television transmissions."

A propos of high-power stations, the Federal Radio Commission of the U.S.A. has recently been examining the profit and loss accounts of stations applying for permission to use high powers. In fact from sources well qualified to know, it is even stated that "Identical questions were put to twenty broadcasters desirous of using 50 kw. Ten showed an annual average profit of about £5,000, the other ten a deficit of about £10,800 covering a similar period. As much as 70% of the programme service of those twenty stations is free, remarks *World Radio*, the remaining time being used by commercial sponsors who pay for time used. The advertising rate per hour for a 5-kw. station during the evening hours is £62, and the monthly income from advertising sources averages about £4,300 per station. The average total monthly operating costs of each station are £4,400. Salaries account for nearly £3,800 of all expenses, artists' fees for two-thirds of this sum. No figures were divulged regarding the anticipated financial benefits, if any, likely to accrue from permission to utilise the increased power should such be accorded. Neither were any facts put forward to explain the cause of the heavy deficit of £10,000 by one half of the petitioners as against the £5,000 profit of the first half.

The suggestion of the Austrian Society (the "Ravag") that the present year should open with the broadcasting of commercial and industrial advertisements met with a blaze of opposition from the half-million payers of the annual fifteen shillings fee, and it is probable, says my informant, that the suggestion is still-born.

"The small business firms which were unable to pay for such advertisements," joined the licencees and the Press. The latter

had already made a number of complaints from different party and political viewpoints regarding the type and nature of certain broadcasts, while, says the *Observer's* Vienna correspondent "their musical and literary programme is criticised for not being sufficiently up to date." Numerous people, too, object to the lighter side of the programmes."

There seems quite a homely touch about these last two criticisms quoted. It is also typical of certain cleavages between the U.S.A. and Europe that the latter does not take kindly to the broadcasting of commercial advertisements, being rather inclined to look upon such schemes as something approaching to a prostitution of the arts. There is, of course, another and maybe more matter-of-fact view, such as that which forms the ground of many of the Austrian complaints, i.e., that the fifteen shillings per year received from the half million listeners was more than sufficient to pay for a full time legitimate programme without the aid of the kronen derived from the publicity given to someone's face-powder or shaving soap!

Little as one would wish to listen nightly to the blatant cries of the vendors of patent medicines, &c., &c., either in one's ear-phones or from the loudspeaker, yet one cannot refrain from expressing the most fervent hope that Europe may be saved that greater prostitution, of one of the greatest potential aids to international understanding, which looms at times in the offing, i.e., wordy propaganda warfares in the ether, backed by 200 kw. or more!

(To be continued.)

THE G.P.O. PLAYERS IN "COCK ROBIN."

THE G.P.O. Players, true to their tradition of ranging over all fields of dramatic enterprise, presented their supporters, on the 12th, 13th and 14th of last month, with something in the nature of a "thriller." Although the play was sufficiently exciting and ingenious to hold the attention throughout, and although a writer of distinction, Mr. Elmer Rice had a share in the authorship, it did not rise above the level of good melodrama. In such pieces the author's invention is chiefly exercised in baffling the audience in their efforts to detect the murderer, and we must admit, in this case very successfully. Of course, we could not know until shortly before the fall of the curtain, that McAuliffe also had a grievance against Hancock Montgomery, and he therefore escaped our suspicion. We could not help wondering, however, whether anywhere but in the realm of drama the resentments caused by a Gay Lothario would turn so many people so readily to projects of maiming or murder. The piece was undeniably full of dramatic moments, and the presentation of the play within the play, both from the front and from behind, was both novel and ingenious. The G.P.O. Players availed themselves of their opportunities to the full. The principal rôle fell to Mr. Sellars, who gave a most convincing and finished rendering of the dictatorial stage manager to the amateur troupe, ably supported by his hawk-eyed Maria (Miss Dorothy Smith), who played her part admirably and had no small share in enhancing the mystery of the plot. Mr. Horace Pilkington was suitably Lovelacean, as Hancock Robinson, before he became the *corpus vile* on which detective wits had to operate, and Mr. Storr gave a capital rendering of the sullen lover who has taken refuge in drink. Miss Margaret Henniker was a charming and sympathetic heroine, and Miss Harwood, as the fussy and important Mrs. Montgomery, was excellent. Mr. Cahill and Miss Stutter made the most of the scene in which they try to draw the blame for the murder on themselves, while the remaining parts, Clark Torrance (well filled by Mr. Jack Scott), Richard Lane (Mr. Laurence Gartland), and Henry Briggs (Mr. Eric Hudson) while they did not give those players the fullest scope for their abilities, were presented in the adequate manner we have learned to expect from this Society.

The play was produced by Mr. Hodgson-Bentley, and the incidental music provided by the indispensable Mr. Will Harrison and his orchestra.

W. H. G.

LONG DISTANCE TELEPHONY IN THE U.S.A.*

By W. C. GRIFFITH.

It was my privilege to visit the United States in the summer of last year as a member of a Commission of four sent to examine the methods of handling long distance telephone traffic employed by the American Telephone and Telegraph Company, and I have been asked to tell you this evening something of what we saw there.

It necessarily follows that much of what I shall have to say appears in the official report made by the Commission, abridged copies of which many of you already have, and I wish to make it clear that when I give you information and fact, it has been gathered by the Commission as a whole and not necessarily by myself personally, and my fullest acknowledgments are therefore due to Mr. J. F. Darby, of the Traffic Section, and Messrs. Jenkins and Thompson, of the Engineer-in-Chief's Office, the other members of the party.

I should like at the commencement of my remarks to pay tribute to the kindness and courtesy of the A.T. & T. Co. to our Commission. Nothing that could be done either to give us information or to make our visit pleasurable was left undone.

As you will all be aware, the telephone was born in the United States. The first words were spoken by Dr. Alexander Graham Bell to Dr. Watson from one room to another in a house in Boston, which still stands and which we visited.

The first conversation which could be dignified by the name "long distance" was between Boston and Salem, a distance of 16 miles in 1880. Boston was connected to New York, 235 miles away, in 1884, and the line between New York and Chicago, 900 miles, was opened in 1892. It is interesting to note that in this case communication was first limited to specified call offices, an arrangement which has recently been repeated in the initial stages of some of the new inter-continental radio services.

Trans-continental telephone, that is from New York to San Francisco, became possible in 1914 with the help of the Shreeve relay, when Dr. Bell spoke to Dr. Watson again. In 1915 the first radio extension was contemplated, and the first transatlantic message was spoken from Arlington, near Washington, to Paris, the words being "greeting" to Colonel Shreeve. In 1927 a commercial service was opened to Europe and in 1930 service was extended to Australia, via London, making a 17,000 mile call commercially available. Through these stages, then, American long distance telephony has developed to the present day.

Telephone service in the United States is given by the Bell system, which consists of 24 affiliated companies, e.g., The New York Telephone Co., The Michigan Bell Telephone Co., &c., in almost all of which the American Telephone and Telegraph Company has a controlling interest, and also by some thousands of independent companies, for the most part very small. Each company, Bell or independent, operates the junction and trunk lines which lie wholly within its territory. The American Telephone and Telegraph Company acts as the general research department and co-ordinating centre for the affiliated companies and in addition provides, owns, and in some cases operates, through its Long Lines Department, the trunk lines linking the territories of the various companies, independent as well as Bell.

The magnitude of the task of providing lines to link any two of the 20 million telephones in the United States can be illustrated by a consideration of the relative sizes of the two territories. From this it will be appreciated that the problem of long distance working in this country is more analogous to that of one of the affiliated Bell companies, working the lines within its own territory, than that of the A.T. & T. Co., the work of whose Long Lines Department is similar to that which would be performed by a company working the international circuits of Europe, if such a one existed. There are, moreover, differences between the problem of providing long distance telephone service in this country and the problem in America other than those associated with mere size—differences of public habit and of temperament which have their effect on demand. When, therefore, facts about the trunk system of America are given it must be realised that they relate to conditions different from those obtaining in this country, and that it does not necessarily follow that American methods in their entirety would in all cases be the best for this country, that what we do here is necessarily wrong and out-of-date, or that American methods which have proved admirable under American conditions should be adopted here without exception or modification.

It was known, previous to our visit, that long distance telephony in the United States had been brought to a very high standard in respect of rapidity of connexion—our numerous critics in this country have made that clear to us on many occasions—but I do not think that the magnitude of the advance which had been made had been fully appreciated on this side: certainly it was with some surprise that the Commission learned that the standard operating method is to attempt the completion of every long distance call throughout the whole of the United States while the calling subscriber waits at his instrument with his receiver to his ear. In other words, the

whole of the United States is in effect what we should call a toll area. (Long distance calls are in fact called toll calls, but this word does not in itself signify calls completed on demand: it was employed before demand working was introduced.) This method of working is called the C.L.R. method—combined line and recording—since it involves recording and control of the call at one position, as distinct from the delay method of operating under which calls are recorded at one position and controlled at another.

This operating method is not, of course, in itself new to this country. It was first introduced here in 1922, when the London Toll area was formed, and it is interesting to remember, therefore, that the method of operating I am describing this evening has been developed simultaneously on both sides of the Atlantic, though no one will deny that it has reached a fuller maturity over the water than it has here.

The standard of long distance service in America has in fact always been higher than our own, just as our standard is normally higher than that of the continental countries. This is not merely an administrative and operating question. It is bound up with public demand—the public get what they will pay for. There is no fundamental traffic or engineering difficulty in giving a "local" grade of service over any area, however wide. The real problem is to give that grade of service, or something very much approximating to it, economically, that is at a cost which will not entail prohibitive rates, and it is this problem that our American friends have solved so completely.

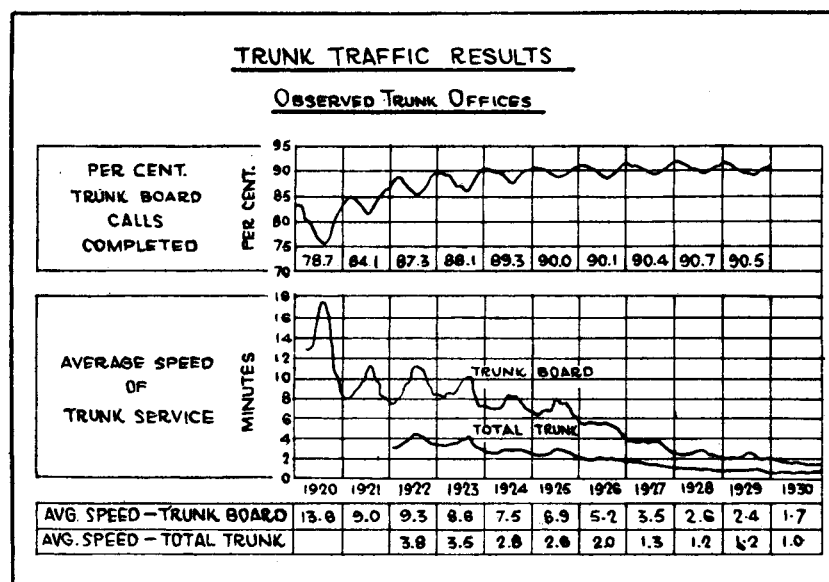


FIG. 1.—STANDARDS OF SERVICE.

I ought perhaps, however, at this stage to mention that in comparing American figures of speed of service with our own it must, however, be remembered that American figures give averages over the whole day, whereas our statistics are usually based on the busy hour conditions only, and do not, therefore, compare so unfavourably with the American figures as might at first appear.

Fig. 1 shows the improvement in quality of long distance service in America in recent years. You will see from the upper curve on the lower table that in 1920, owing to post-war difficulties, the average delay on long distance calls throughout the day was 13.6 minutes, that this fell to a more or less stable figure round about 9 minutes during the next three years, falling to 7.5 minutes during 1924. The improvement over this period was due to consistent and continuous effort to improve operating, but was not due to any change in the system of operating or in the basis on which long distance circuits were supplied. The lower curve refers to all calls beyond the local area, and naturally shows an even better average as it includes much short distance traffic. The top curve refers to percentage of calls completed to calls booked. Further reference will be made to this at a later stage.

In 1925 "C.L.R." working began to be introduced, and was extended until it covered the whole country by the spring of 1930. The effect of the change of operating method is clearly shown by the curve. The average speed of service in 1930 fell to the truly wonderful figure of 1.7 minutes, that is the average time from making the demand to the commencement of conversation or to the giving of a definite report (e.g., that the called person was not available) was only 1.7 minutes on all truly long distance calls and only 1 minute on all calls beyond the local area.

The first natural comment of those who hear of this class of long-distance service relates to the enormous provision of line plant which it must entail, and I think the most striking thing I have to tell you about American long distance telephony is that the basis of provision of external line plant has not changed from the time when the average grade of service was 13½ minutes till now that it is 1.7 minutes. The standard of provision of circuits has

* Paper read before the Telephone and Telegraph Society of London.

remained unchanged. The truly remarkable thing about long distance telephony in the United States is not that a toll grade of service is given—there is nothing inherently wonderful in that—but that that grade of service is given by means of line plant originally planned to give a “delay” service, and the result achieved by sheer efficiency. It is said that an engineer is a man who can do for a penny what any fool can do for twopenny. On this basis the American traffic officers are truly traffic engineers.

The method of operating long distance calls is, as stated, similar to that which is employed in London Toll exchange. The fact that no additional line plant has been provided is compensated for by a generous provision of operating staff, by the provision of various devices or aids which make operation easy and smooth, by amalgamation of routes into both way groups and by the free use of alternative routes. These aids assist not so much by reducing the time taken to set up a straightforward call—that is so brief a period in itself that it is not susceptible to substantial reduction—as by making the surmounting of the hundred and one difficulties which arise in practice, speedy and smooth. They reduce the time of the difficult call. The American telephone companies seem to have absorbed very fully the teachings of the parable of the lost sheep. The ninety and nine calls may go smoothly, the hundredth may be lost, then all the attention of the organisation is concentrated on a procedure which shall make the hundredth go smoothly also. 99% good is not good enough with the American telephone administration.

Exchanges are graded for long distance purposes into local, toll centres, primary outlets and regional centres. All local exchanges have direct access to their toll centres, which are the controlling exchanges, i.e., the exchanges at which the long distance board in each area is situated. Primary outlets are switching centres usually having connexion to all other primary outlets in the same State. Regional centres comprise the eight main centres, each of which has a direct group to every other. The maximum condition of connexion is therefore local exchange—toll centre—primary outlet—regional centre—regional centre—primary outlet—toll centre—local exchange, i.e., 6 intermediate switchings. Such a condition is, however, very rare in practice. Only 1% of the traffic circulates, in fact, through as many as three intermediate centres.

Let us now consider the methods by which subscribers secure their long distance calls and run briefly over the operating procedure which produces the high grade of service to which I have referred. A manual subscriber desiring to speak to a place outside his local area asks his exchange operator for “Long Distance,” and is plugged through on a low transmission grade circuit terminating on a control position at the long distance exchange, where the demand is answered by a long distance operator who secures particulars of the calling and called subscribers' numbers. This operator then proceeds, as overlapping operations (a) to secure the distance subscriber and (b) to reverse the call to the calling subscriber. This reversal is carried out without the knowledge of the calling subscriber or replacement of his receiver, by asking on the outgoing junction from the long distance board to the local exchange, which is of high transmission value, for the number given by the calling subscriber “Without.” A “B” operator at a local exchange receiving such a demand plugs into the number demanded without regard to the engaged signal. The long distance operator then releases the original connexion on which she first answered the calling subscriber, and all subsequent conversation, including the long distance call itself, takes place over the reversed line. The necessity of this reversal are twofold: firstly to bring in, for transmission reasons, a higher voltage (40) than given by the local exchange battery (24), and secondly to secure switchhook control of the answering supervisory lamp, a control which would not pass through the “A” cord circuit used in the original connexion. An automatic subscriber desiring a long distance call dials 211 (or 110 in some cases) which gives him a direct circuit to the long distance board. Through signalling from the calling subscriber's switchhook to the long distance board in this case presents no difficulty as there is no “A” cord circuit in the connexion and as the automatic exchange battery voltage is adequate, reversal of the call is unnecessary and the “211” lines are therefore provided of a grade suitable for the long distance call itself, and the local connexion used to make the demand is also used for the call itself.

It should be mentioned that in certain areas the distinction between calls controlled at the local switchboard and calls controlled at the long distance board is too complicated for the public to remember, and in these cases—New York is a case in point—the local operator accepts all demands and herself passes forward to “long distance” those appropriate while the calling subscriber remains on the line.

The demand now having reached the long distance board, we may consider its treatment there.

The incoming record lines from the local exchanges, manual and automatic, are ancillary on the long distance board over the whole suite of long distance positions on which they appear, and the call may thus be offered to upwards of fifty or even more long distance operators. Any disengaged operator then answers the call and proceeds to operate it, and it alone, until conversation commences, leaving other calls to be answered by other operators elsewhere in one of the other ancillary repetition jacks. There are no “primary” jacks. All calling signals are equally the responsibility of all operators.

The long distance operator having ascertained the calling number and called number, in the normal course proceeds to set up the connexion, no matter what the called exchange, while the calling subscriber holds the line (reversing the connexion to calling subscribers on manual exchanges as explained).

It will be obvious that the long distance operator cannot know the routing of all the calls which reach her, and in order to give her this and other information, the necessity for which will be dealt with later, she is supplied with a routing chart. This chart takes various forms, of which, perhaps, the commonest is the Kardex type.

This file gives, for all the exchanges to which calls are most commonly made the following information in the manner indicated:—

Whether directory work is done locally, as indicated by the “D.”
Whether the call is “multi-switch,” as indicated by “MX.”

The distant Toll centre.

Whether a repeater must be asked for at the intermediate exchange when these calls are set up, as indicated by an “R.”

The absence of an entry under first route indicates that the originating exchange has a direct line to the specified Toll centre, and the alternatives are shown in full.

When calls are received for places not on the operators' list, reference must be made to a central “Route and Rate” position (or suite of positions) at which information as to all exchanges is filed. Reference to the route and rate position is made by the controlling operator as soon as she finds that the information is not on her file, by means of a “straightforward junction” circuit with a visual indication of an idle circuit to an idle “route and rate” information position.

All outgoing long distance groups appear in part or as a whole in a multiple before the long distance operator, who finds the relative route in this multiple with the help of designation strips which give additional information in themselves. Her choice of an idle circuit in the group is guided by an idle circuit indicating lamp.

The idle circuit indicating signal is given through a translucent hole in the designation strip and therefore only one spot shows per group. This ingenious method has two great advantages over the method of separate lamps. Firstly, it avoids the use of a special strip of lamps, which means that 50% more circuits can appear in a multiple of given size than could so appear if a third strip were required for visual indicating signals, and, secondly, it avoids the difficulties of glare and distraction from bright lights continually before the eyes of the operators, a difficulty which has been very real when visual engaged signals of the lamp strip type have been employed in this country.

In the event of no idle circuit being available, the demand operator will have immediate recourse to her first and second alternative routes. If neither can assist she will watch the primary and alternative routes for an idle circuit for a period of one minute from the first reception of the subscriber's demand before reporting to him that the lines are engaged and that she will ring him later. By introducing this interim period, the number of calls set up “on demand” is very much higher than would be the case if the calling subscriber were released if connexion could not be given at once. In effect, trunk lines to give a “demand” service can be supplied on a basis under which one will become free within one minute instead of on a basis under which normally one will always be free, as is the practice in the provision of junctions.

Even if no line on the normal or alternative route can be secured within a minute and the calling subscriber is told to hang up his receiver, the connexion between the long distance operator and the subscriber is not released. The long distance operator holds the subscriber's line till ten minutes from the first receipt of his demand—i.e., for nine minutes after releasing the subscriber himself—before she herself gives up the attempt to complete the call. By holding the connexion to the subscriber, the long distance operator ensures that his line will not be taken for other calls and that she also is in a position to re-ring him direct from her board if she secures the necessary trunk line in the period and she is thus able to avoid any delay incidental to setting up the local connexion again. Should the subscriber attempt during the period his line is held to use it to make any enquiry about his call, his signal will come up to the long distance operator who is holding his line and who can answer his enquiry direct. If he desires to make some other call she will, of course, release his line on request to do so.

When, as is the normal case, the long distance operator secures a trunk line for the call in hand on the first attempt, she rings over it and secures the attention of an operator at a suite of incoming positions at the distant end. If the call is “direct,” i.e., is terminal in the area of the long distance exchange at the incoming end, the incoming operator secures the subscriber's line required in the usual way. (In passing, it may be mentioned that there is no “interruption” procedure for offering long distance calls to subscribers whose lines are engaged).

If the call is “through,” that is, must be passed forward over a second trunk line, the operator at the intermediate exchange has in some cases direct access to the outgoing trunk multiple and can put the call through herself. In big exchanges, however, the space required for the incoming trunk lines and the outgoing local junctions is so great that there is not room on the positions for the outgoing trunk multiple also. In such cases, a special suite of through positions is supplied, equipped with ancillaries of the incoming trunk lines and multiples of the outgoing trunk lines. An incoming operator getting a demand for a through call transfers it to the through suite, usually by means of a press button associated with each incoming line, the actuation of which lights the calling lamps associated with that incoming trunk on the through positions. A through position operator then answers upon the incoming trunk and sets up the through connexion, which thus does not pass through the incoming suite.

If a call has to pass through two or more intermediate exchanges between the outgoing and the terminal trunk centre, it is called a "multi-switch" call and receives preferential treatment on an almost royal basis. In passing such a call forward from exchange to exchange, the demand is prefixed "multi-switch" and every intermediate operator receiving such a demand must remain in circuit, and must render any assistance necessary, until satisfactory conversation starts between the subscribers. In the event of a "no circuit" condition at any point on a "multi-switched" call, the operator unable to give the onward circuit has a procedure for seizing a circuit in the relative group as soon as one becomes free.

We have now dealt with the straightforward station-to-station calls which encounters no difficulty, and these constitute a great majority.

Nevertheless, difficulties do arise and special requirements do have to be met.

The commonest difficulty to be overcome is inability to set up a call within the ten minutes that the calling subscriber's line is held due to the absence of the called party on a personal call, or, less commonly, to difficulty in securing a trunk line at some point.

If an operator at a demand position is unable to complete a call within ten minutes, or if at an earlier time she knows that she cannot complete it within that time, e.g., if she receives a report that the called party will not be in for an hour, she releases the calling subscriber's line and sends the ticket to a "delay" position and then ceases to have any responsibility for the call in question.

The "delay" positions form a special suite, and although equipped with the outgoing trunk multiple (and, of course, with the multiple of circuits to the local exchanges) specified positions deal with calls on specified routes only, just as long distance calls are normally dealt with in British trunk exchanges. Tickets of calls which cannot be completed within the specified time at the demand positions are sent to the delay position appropriate to the route. The operators at these positions then endeavour to complete the calls. If the delay has been due merely to difficulty in getting a trunk line, the delay operator having already, or by waiting her opportunity, secured a line on the route for which she is responsible, proceeds to work off the delayed traffic she holds.

More commonly, however, calls which reach this position have been delayed due to difficulty in tracing the person required on a person-to-person call. In these circumstances, if the time of return of the called party is uncertain the called telephone station is asked to notify the local long distance exchange when Mr. So-and-so returns and is ready for a call from such-and-such a place. Any such report of availability is passed back to the named originating trunk exchange and is there switched to the relative delay position, where the ticket is awaiting it, and the call is completed if the calling subscriber can be secured at once.

When a delay operator sets out to complete a delayed call, her first step is to secure connexion to the line of the calling subscriber but not to ring him. This prior seizure of the calling line prevents the failure of a difficult delayed connexion due to the calling line being "engaged" when the long distance chain has been built up.

That, then, is a brief description of the handling of calls which have been delayed.

(To be continued.)

A WIRELESS MASCOT: THE MILLIAMMETER.

BY B. S. T. WALLACE, C.T.O.

(Continued from p. 108.)

HERE is a good example. A few years back an esteemed wireless contemporary, in a commendable effort to evolve new circuits and principles, hit upon the idea of using the filament of a valve as the control grid also, turning the grid into the plate and leaving the plate itself up in the air or on the earth—it is forgotten exactly which.

Unusually good and convincing reports were published concerning the performance of this circuit. As it was decidedly original and the theory of it not apparent, the writer decided to investigate and made the circuit up with, as a matter of course, a milliammeter in the H.T. lead.

There was no question about the vastly improved signal strength over the more conventional type of circuit, but simultaneously the explanation of the phenomenon was only too evident on the face of the milliammeter. It was registering

an H.T. current of three times the normal value for the particular valve used. This negated all the apparent virtues of the circuit, for not only was this excessive current ruinous to the battery, but the emission of the valve also would have been destroyed before the normal duration.

A colleague, before hearing of this experience, observed that the circuit "appeared to run his batteries down badly." A meter would have warned him in time.

When first using a milliammeter, the individual anode circuits should be experimented with to study the varying currents taken by the different types of valves. This meter is frequently used in the last power stage only as this is the place where distortion makes its presence felt, but it can also arise in the other stages. It cannot be too strongly emphasised that it is impossible to use a good H.F. stage in front of the usual type of grid lead detector anywhere near a high power station without bad distortion occurring unless adequate arrangements are made to cut down the signal that would normally be delivered to the detector. If it is desired to use the H.F. valve "all out," anode bend detection adequately biased is advisable in these circumstances. It will rectify safely a much heavier signal than the alternative method.

These facts should be noted before reading the following paragraphs in which the symptoms and diagnosis of various faults by means of the milliammeter will be given. For the sake of explanation of the major faults it is going to be assumed that we have a popular three-valve receiver with a meter in the negative H.T. lead, that all the batteries are in good condition to commence with, and that the detector is not being overloaded.

With set switched on and no incoming signal, the milliammeter pointer should be stationary and indicate the total permanent current passing through the anode circuits. When a signal is coming in the needle should still remain stationary. Should it kick upward, i.e., increase spasmodically, there is too much negative bias on the power valve; reduce it. If the deflection decreases in similar fashion then the bias is too low; increase it. If an alteration of bias will not steady the deflection but only convert it from an upward to a downward movement, or *vice versa*, or if it appears to fluctuate above and below the steady value, then the power valve is being overloaded. The input signal to it must either be reduced in strength or a heavier valve used. Your meter must remain perfectly steady while the loudest passages of music are coming in; this is as imperative as getting a steady deflection on the galvanometer of a duplex telegraph circuit when obtaining a balance. It is the first and most important end to achieve.

The possibility is that on first trial the meter will be anything but steady. Though you may be satisfied with the quality of reproduction from your loudspeaker, distortion is going on. This is quite easy of explanation. The very best reproduction at present obtainable is only a distant representation of the real thing, very much as the films portray a scene. In both cases, what is missing to the ear and eye is largely built up by the imagination and one is more or less satisfied. It is only when something better is experienced that a previous imperfection is realised. It is even so with the reality: classical music, for instance, is frequently not appreciated until one has been educated up to it.

If after behaving well your current falls slightly and the milliammeter develops an upward kick, then it is most probable that the H.T. voltage is commencing to fall and the grid bias must accordingly also be reduced to accommodate. Make a special note of this. It is one of the leading causes of distortion usually overlooked; grid bias must be adjusted to a falling anode voltage.

Your set develops a crackle and is generally below par though the meter reading is about normal but fluctuates slightly when no signal is coming in. Watch the needle closely. Take out the H.F. valve. The deflection will drop a few milliamps. and the movement probably continue. Take out the detector valve. The deflection will drop a trifle lower but if the needle now remains

quite steady the fault is in the detector anode circuit. Suspect the primary winding of the transformer, short circuit it with a length of wire, and replace the detector valve. If the crackling has ceased and the needle is dead steady the fault has been located to varying conductivity in this primary winding, which is the usual prelude to a complete disconnection. This is the principal fault associated with crackling noises and is very elusive and deceiving because the speech signals are still passed through the faulty transformer by virtue of the capacity of its windings.

Acute distortion develops concurrently with an increase in the permanent anode current—this may indicate a failure of the grid bias battery.

The meter deflection suddenly and progressively falls; L.T. accumulator petering out.

Silence and total failure of incoming signals but deflection normal—suspect grid circuits and if possible first change all valves, one at the time, to prove they are clear of internal faults. The one-time common fault of a filament touching the grid is now rarely met with, but internal faults in the leads occur occasionally. Where grid bias is normally fitted to a valve, its grid circuit can be proved by varying the bias and observing the response on the meter. If there is no response the fault is in that circuit or beyond it. Where there is no grid bias normally, it must be temporarily arranged for testing. A negative bias on the grid will reduce the anode current, and a positive bias increase it. These grid faults are frequently caused by the bad fitting of the valve pin in its holder; otherwise first look for them in the aerial circuit. If by inserting a grid bias battery in the aerial circuit no effect is produced, disconnect the wire from the grid terminal and connect a bias testing battery as shown in the diagram. If now the meter responds, then a disconnection in the aerial circuit, or perhaps an earthed grid, may be looked for. Suspect connexions to aerial inductance, particularly if it is of the six-pin variety, or look for a broken wire. Poor quality wire of fine gauge will perish and break in a comparatively short time. (One popular series of receivers utilises 42 S.W.G. for aperiodic aerial coupling. This wire is too weak mechanically for a permanent receiver.) Overhaul aerial and earth leads and connexions for possible short circuit, making a direct earth connexion with the grid.

Silence and total failure of incoming signal with reduced deflection—look for a burnt out filament in one of the valves.

Failure of incoming signals, together with a big increase in anode current; this suggests a positive potential on one of the grids. It may be caused by an accidentally reversed grid bias battery, or a short circuit in a coupling condenser between anode and grid. Occasionally the polarity is wrongly marked on grid bias batteries, and it is as well to prove the correctness or otherwise of this before putting them into use. Coupling condensers of all types should be tested for good insulation before incorporating them in a receiver.

A failure of emission is mostly liable to develop in the power valve. It is a frequent experience when using eliminators of uncertain voltage, the maximum permissible H.T. for the valve in use being often exceeded. It is characterised by a gradually weakening signal and fall in anode current. The current this valve alone should pass, being known, any fall in the meter deflection while all the batteries are normal and the circuit otherwise in order, can be assumed to be due to loss of emission.

Occasional clicks in loudspeaker accompanied by a sharp momentary increase of current—this is caused by the puncturing, short-circuiting, and subsequent self-repairing action of a Mansbridge condenser used for smoothing purposes across the H.T. battery. It is experienced with the cheaper forms of this condenser, and though it is not strictly speaking a fault—for the principle of this condenser presupposes such a contingency—the effect, if persistent, indicates that the condenser is unable to stand up to the voltage applied across it and should be replaced.

A slight deflection when valve filaments are switched off is an indication of an H.T. leak which will be due either to conduction across a moist surface, poor insulating material—especially in six-pin coil holders—or bad insulation of H.T. smoothing, or other condensers. This fault is localised by successively disconnecting and joining up all possible paths connecting with H.T. positive.

A receiver, when oscillating, may cause an increase or decrease in the anode current dependent on the method of rectification used and the type of reaction employed. In most receivers a slight increase of the total anode current will be registered while the set is oscillating.

For observations on small currents a 5 milliamp. range is desirable and, again, the value of a double range instrument should be obvious. Failing this, acquire a low range instrument and make your own shunts. It is a simple matter, but exercise care in connecting the shunts securely before applying the heavier currents.

Finally, there is the exception to every rule, and the departure from common practice. Should you be the owner of a receiver made by a technical friend, and presented with the admonition that it is a special circuit and should not be interfered with in any way; and that after reading these notes a growing feeling of doubt concerning the quality of its reproduction tempts you, with some trepidation, to place a milliammeter in circuit, do not be unduly alarmed if the needle fluctuates wildly as if in vigorous protest. There is at least one tolerably good arrangement which only functions correctly when the anode current is varying within wide limits.

Hidden in the corners of the Patent Office are thousands of wireless receiving circuits the majority of which have never seen the light of day in commercial form. Some of these are fantastic imaginations, others stupid and silly; many are paper circuits devised by company promoters or "inventors" ever ready to sell a "pup." There are a few, however, that have proved sufficiently lively to escape and prove their merits. Such circuits are to be found here and there about the country. They are anything but "straight" and usually require a certain amount of theoretical knowledge in arrangement and manipulation. In some cases meters are necessary for their correct adjustment. This prohibits a more widespread use.

This article is dedicated to the average listener's straight receiver, and as a mascot for these sets that will see him right in all troubles and enhance his interest in wireless a thousandfold, nothing can approach a good milliammeter. A receiver without one is like a woman without a mirror—helpless.

TRANSATLANTIC TELEPHONY.

THE romance of long-distance wire and wireless telephony appeals to almost every person, and the tall masts of the gigantic Post Office wireless station at Rugby are familiar to most travellers by road or rail; but not everyone has an opportunity of visiting and examining the methods of transmitting speech over several thousand miles of ocean. With a view to bringing the wonders of the system before the public, the Post Office is prepared to lend a cinematograph film on the subject to literary societies, social clubs, and other organisations. Applications for the loan of "Voices across the sea" should be made to the Engineer-in-Chief, Alder House, Aldersgate Street, London, E.C.1. We understand that early application is desirable as the film will only be available for a short period.

THE HAIG PIT COLLIERY (WHITEHAVEN) DISASTER, JANUARY 29, 1931.

THE disaster at the Haig Pit, Whitehaven, which occurred on the evening of Jan. 29, and in which 26 men lost their lives, will still be fresh in the minds of our readers, and they are no doubt fully familiar with the details of the catastrophe as published in next morning's newspapers. Our Telegraph and Telephone colleagues will realise, however, that, between the time of an accident of this magnitude and the publication of the news, there arises a tale in which the officers of the Department have risen to the occasion and "delivered the goods." It is proposed in this article to give a short account of what happened behind the scenes at Whitehaven Exchange on the night of the disaster.

Before handing over the tale to be told by the officers actually concerned, it may perhaps be stated that the investigations into the possibilities of introducing the demand method of handling long distance traffic on the lines of the American report in the North-Western District accounted for the happy coincidence that Traffic Officers were in Whitehaven and Carlisle at the time of the disaster and were thereby in a position to help when help was badly needed.

After this short introduction I will hand over the telling of the tale to the officers directly concerned.

* * * *

It was a fortunate coincidence that circumstances should lead to the presence of two Assistant Traffic Superintendents (Messrs. Hodgkinson and Blake) in Whitehaven on the night of the disaster.

The exchange at Whitehaven consists of 3 C.B. No. 12 positions, and the work dealt with on this night assumed proportions normally met with only at exchanges of much greater size.

A chance remark by a fellow visitor to our hotel resulted in the information of the disaster being received. We proceeded immediately to the Exchange to see the condition of affairs and were pleased to find that the Head-Postmaster had anticipated us and had called out the day operating staff; in fact, one of these had rung up immediately she heard of the disaster to ask if her services were required.

The Postmaster had also placed at the disposal of the Press correspondents six or so speaking points for distribution of their reports. Calls were pouring in from newspaper offices all over the country, and at one time, shortly after midnight, enquiry of the Manchester trunk staff revealed that they had 20 calls lined up—all for one Whitehaven number. This number was almost continuously engaged from about 10 p.m. to 4 a.m. on the morning of the 30th collecting information respecting the disaster. To dispose of the traffic, the assistance of the local Engineer and the Caretaker Operator was enlisted, in collaboration with the representatives of the local Press agency, for the purpose of passing to enquirers the latest bulletins of the disaster. The Head Postmaster and the Traffic Officers assisted in this direction when attention to other matters was not required. The "line" of 20 calls was expeditiously disposed of in this manner, but fresh calls were coming in without respite. Alternative routing for originating calls was, of course, necessary. It was arranged with Barrow for continuous attendance to be given and the Barrow-Manchester trunk route to be readily available for Whitehaven Zone traffic in both directions. Manchester Trunk were requested, and agreed, to

bring on extra staff in order to staff the Barrow and Carlisle positions continuously during the period of pressure.

There appeared to be some slight hitch at Carlisle and it was deemed advisable to call up Mr. Morgan (the Traffic Superintendent) who was at Carlisle, a strategic switching point, and the information of the disaster was imparted to him. He arranged for extra staff at Carlisle and also spoke to Glasgow and Newcastle Trunk Exchanges requesting their co-operation. As a consequence of these arrangements the disposal of incoming and outgoing long distance traffic was effected as smoothly as possible.

Meantime, however, the callers from London, Manchester, Bradford and other distant places had apparently realised the difficulty of access to the number of the Whitehaven Press Agency and calls were coming in to the hospital, the colliery doctors, nurses, mine agents, police, and apparently to anyone who was at all likely to have any information regarding the disaster. Doctors were either dealing with casualties or were otherwise unavailable; the hospital, naturally, was too busy with the new patients, and for one period, the line was "no reply," as were most of the called numbers also. It became necessary to intercept all these calls and to enquire of the caller what his requirements were. All calls so treated on which information of the disaster was being sought were switched from the "enquiry bureau" which had been established to one of the special speaking points provided, whence the latest bulletin was supplied.

After a 20 minutes call from a London newspaper office to the hospital, most of which was taken up by repetition, spelling of names, &c., the writer invited the hospital staff to furnish their bulletin for incorporation in the general copy. The invitation was accepted willingly and further telephonic disturbance of the hospital for long distance calls was thus avoided. From that time all the information available was passed from the points in the Post Office.

Towards 3.30 a.m. the traffic decreased considerably; the last incoming long distance call received during the rush period was established at 3.50 a.m., and at 4 a.m. the day staff were released and the Caretaker Operator took up his operating duty. Continuous attendance at the switchboard was, however, maintained throughout the remainder of his period of duty.

At about 3.45 a.m. a call was received from the police-station requesting a zone call to a Newcastle newspaper office on behalf of two newspaper correspondents. It was explained that they had not sufficient change to pay for the call in a coin box but an assurance was given that the charge would be deposited at the post office when open. The names of the correspondents and of the newspaper with which they were associated were requested and given, and the call was allowed. The charge, 22s. 10d., was handed in at the post office the next morning and was deposited in the kiosk multi-coin box outside the head post office to which line the call was debited.

As stated, things had quietened down by 4 a.m., and we left the office for a brief period of rest, with the injunction to the Caretaker Operator that he should call us if difficulty arose. When we reached the hotel the proprietress took the opportunity of seizing us for a discussion regarding the installation of a multi-coin box at the hotel. The lady's wishes for discussion were fully met, but one could not avoid the feeling that bed was preferable at that hour.

Traffic at the exchange the next morning was naturally above normal, but the staff on duty was adequate to deal with it without difficulty, and it was possible to move on towards Carlisle about noon. We should like to tell you about the return journey south when we were snowbound at Keswick after 10 or 12 miles in the teeth of a blinding snowstorm with the windscreen open, but as this has nothing to do with the narrative we must desist, and thus ended an eventful week.

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

III.

EXPLAIN, and illustrate by means of suitable diagrams, how the following (a) line wires, (b) battery leads, (c) earth leads, are connected to the instrument tables and apparatus at telegraph offices. Arrangements for loop circuits and primary batteries may be ignored.

A prize of a book will be awarded for the best answer, which should reach the Editor by Mar. 31. The correct solution will appear in the May issue.

SOLUTION OF QUESTION I.

It has been difficult to assess the papers on account of their general high standard. In several cases quite good answers were

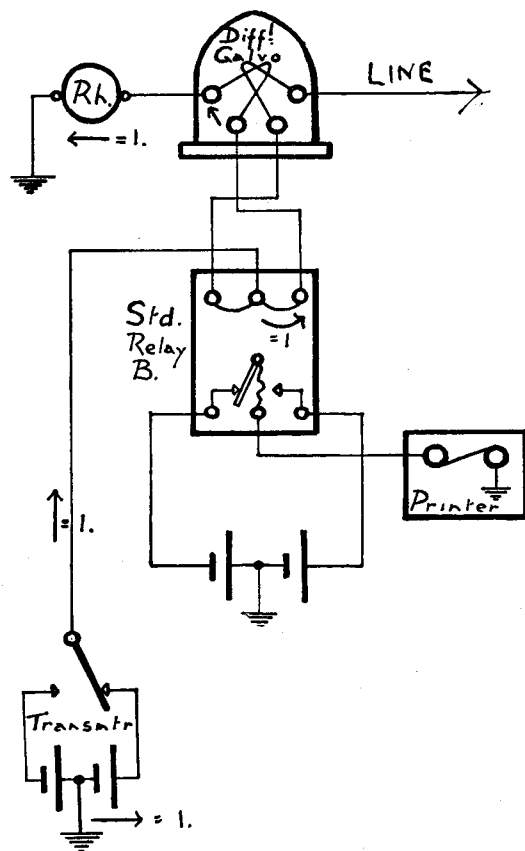


DIAGRAM I.

Teleprinter double current. Differential duplex circuit. When batteries are in opposition on line the current in battery and Compensation circuit is of same value.

contained in a general statement of the principles involved in duplex working, the extraneous matter, however, contained slight errors.

Mr. E. H. JOHNSON (Harrogate) submitted a complete answer, expressed with extreme lucidity, and the prize has been awarded to him.

Mr. G. UPPADINE (Nottingham) also gave a complete answer by means of diagrams. His illustrations are of exceptional merit, and the Editors have been placed in a position to award a prize of equal value to this competitor also.

The vital part of Mr. Johnson's answer, which was amplified and illustrated by diagrams, is as follows:—

“The current values in the battery and compensation circuits, when the batteries are in combination, as, for example, when the keys at both stations are at rest, or

depressed, is as 3 to 1. When the batteries are in opposition, that is, when one key only is depressed, the values are as 1 to 1. In the first case the current through the battery is three times that through the compensation circuit; in the second case the current in the battery and the compensation circuit is the same in value.”

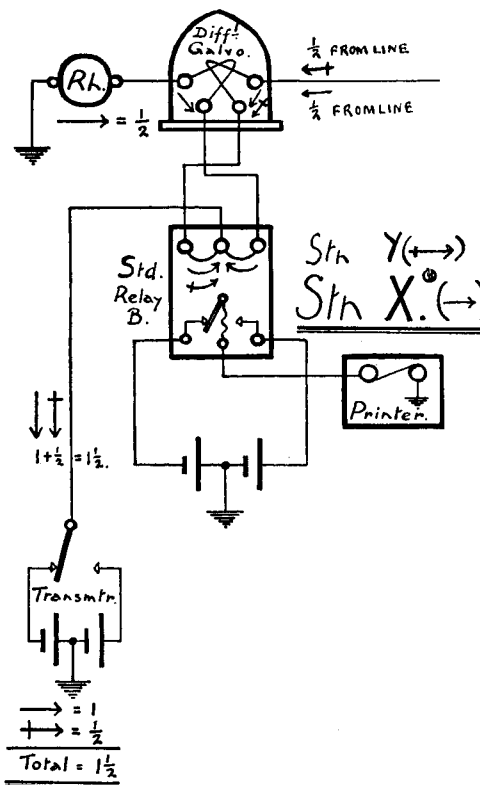


DIAGRAM II.

When batteries are in combination on line, the current in battery and compensation circuits is as 3 to 1.

Mr. Uppadine answered the question by means of diagrams, shown herewith. A brief explanation accompanied the diagrams.

THE INSTITUTION OF POST OFFICE ELECTRICAL ENGINEERS.

BOOTH-BAUDOT AWARD.

APPLICATIONS are invited for the “Booth-Baudot Award” of £10 which is offered annually for the best improvement in Telegraph, Telephone or Radio Apparatus or Systems. The award is governed by the following conditions:—

1. The Award will be restricted to employees of the British Post Office.
2. Applications for the Award should be made between Jan. 1 and Mar. 31, 1931, and such applications should refer to improvements made, or suggested, during the twelve months ending Dec. 31, 1930.
3. The Award may be withheld at the discretion of the Council of the Institution of Post Office Electrical Engineers if, after full consideration of the applications received, the adjudicators appointed by the Council are of the opinion that no award is warranted.
4. Applications for the Award, accompanied by full details of the improvement, should be addressed to the Secretary, The Institution of Post Office Electrical Engineers, G.P.O. (Alder House), London, E.C.1.

P. G. HAY,
Secretary.

December, 1930.

TELEGRAPHIC MEMORABILIA.

THE Paris correspondent of one of the leading London daily newspapers reports that of the resolutions passed at a congress of French Civil Servants employed in the offices of Ministers of State, not one contained a request for an increase of pay! One plea, however, read thus: "In view of the necessity of augmenting our prestige . . . we demand the substitution for the old-fashioned, misleading titles, Assistant Superintendent, Senior Clerk, Assistant Clerk and Clerk, those of General Administrator, Chief Administrator, Principal Administrator, and Administrator!"

With the recollection of many years ago to guide one, it would not be difficult to presume some subtlety behind the French request, for it was maintained for many years in our own Government Telegraph Service that the staff made a very serious mistake when they permitted themselves to be officially termed "Telegraphists" instead of "Telegraph Clerks" without a word of protest. There is, however, much in a name at times, especially in official nomenclature. No long-experienced and highly-skilled telegraphist cares to hear the passing visitor exclaim, lorgnette in hand, "I see; it's just an ordinary typist's work," for it just isn't ordinary typist's work!

Personal.—Too late for acknowledgment in our last issue I would now endeavour to express my keen appreciation of certain of *Les Rapporteurs* of the C.C.I.T. of 1931 who so kindly sent their autograph greetings from Sgravenhage to "their old member and friend." To one and all my grateful thanks!

Companies.—Western Union Telegraph Co.—Gross revenue for year ended December, 1930, \$133,629,598, compared with \$148,449,854 for 1929. Imperial and International Communications, Ltd.—The estimated traffic receipts for year ended December, 1930, were £5,365,561, compared with £6,146,452 in 1929. Baird Television, Ltd.—Lord Ampthill, at adjourned meeting, Jan. 27, said negotiations with the Pathé-Natan group had been successfully concluded. The new company would work in close co-operation with themselves and with their associated company, the Fernseh A.G., in Germany.

Obituaries.—Also too late for last issue was the news of the death of two pensioned officers of the Cable Room, C.T.O., Mr. Harry Ramsden, senr., formerly of the Submarine Telegraph Co., and then with the Government Telegraphs at the transfer, and Mr. J. Ivory, who was also a transferee to the Government service from the same private company. The much beloved "Harry" was pensioned just 29 years ago, leaving the service in excellent health, amidst a send-off the heartiest for which one could wish. Fond of the open air, with a lifelong knowledge of forest footpaths in the Epping district, &c., and a man of simple tastes, he bore his 80 odd years well and happily. As a contrast no one would have dared to prophesy that "Jack" Ivory would have spun his life out to 74 years, had they seen him panting for breath as he painfully climbed the stairs day after day from Roman Bath Street, nearly 30 years ago. The lamentable decease of Mr. Victor Castelli at, again by contrast, so early an age was sympathetically referred to in the C.T.O. notes of February.

Retirement.—The kindest of kind thoughts and wishes will follow Mr. Harry Townsend, Assistant Accountant-General, into his well-earned retirement. There were only a few of the C.T.O. Telegraphs officers who came into close contact with Mr. Townsend, but those few have recognised, and will always appreciate, the privilege of his fellowship and friendship. That Mr. Townsend's active brain will find plenty of scope for increased activities is a sure prophecy. Will it be the pursuit of Einstein? He, alas, has already disowned some of his own children! Aldous Huxley? He, likewise, is disenchanted with his early efforts. Even Eros turns out to be non-spheroidal! Courage, dear H.T., there is always the violin and the musical festivals by the sad sea waves—Bournemouth, Hastings, and now Brighton!

Countries.—AFRICA.—Sixteen new wireless stations will be established in connexion with the Cairo-Cape airway, the first section of which was inaugurated on the 28th ult. On this section of the Croydon to Cape route wireless direction-finding equipment will be used for navigating purposes and telegraphy, not telephony, will be mainly used "because of its considerably greater relative range," says *The Electrical Review*. ALGERIA.—*World-Radio* states that it is intended to transfer the Rabat station to Bouznika, when the power will be increased to 20 kw. The cost is estimated at two million francs. ARGENTINE.—Reuter's Buenos Aires agency announces the opening of a direct wireless telegraph service between the Argentine and Holland on Feb. 2. AUSTRALIA.—The P.M.G. announces that £70,000, the balance of the Postal Department's share of listeners' licence fees after all charges to date have been paid, has been diverted to general revenue. Listeners' fees were to have paid for 16 new relay stations, but the building of 12 of these has now been postponed indefinitely. BELGIUM.—The new law came into force on Feb. 1 last when the National Broadcasting Institute made its first transmission through the Velthem station at a power of 15 kilowatts, wavelength 508.8 metres, in the French language, and 333.5 metres in Flemish. Every possessor of a listening set must pay a fee of 60 francs per annum.

CANADA.—It was announced by Reuter's New York agency a few weeks back that the amalgamation of the commercial telegraph systems of the Canadian National and Canadian Pacific Railways was under consideration in connexion with the proposed merging of the Canadian wireless and cable systems into a single unit. Other information, from Ottawa on this occasion, says that "one company co-operating with, and on the same basis as, Imperial and International Communications, Ltd., of Great Britain, has been discussed by Sir Basil Blackett with the Federal Cabinet at Ottawa. Sir Basil proposed that the Canadian Pacific and Canadian National telegraph and cable systems, together with the Canadian Marconi systems, should become 'partners' with Imperial Communications." CHINA.—The first concrete results of eight months' negotiations between the Chinese Government and the foreign cable companies (Eastern Extension, Great Northern and Commercial Pacific) whose contracts with China expired at the end of 1930, were actually concluded only a couple of weeks before that date. Representatives of the Eastern Extension and the Great Northern Companies agreed to the transfer to China, says a Nanking agency, as from Dec. 24 last, of the control of the Shanghai-Chefoo-Taku (Tientsin) submarine cable, which has remained under the complete control of these two foreign companies since its inauguration in 1901. CZECHOSLOVAKIA.—The new transmitter near Böhmisch is ready. Prague will have two stations, namely, the existing 5-kilowatt station and the new transmitter, which will have a power of from 60 to 120 kw. There are now 300,000 listeners in the country, with its population of twelve million. CANADA.—The new 24-channel telegraph circuit passed its experimental stage and went into actual commercial operation on Jan. 15, between Montreal and Ottawa, a scientific fact, says my informant, which is performed on a single pair of wires. DENMARK.—The Minister of Public Works has laid before Parliament a Bill which will prohibit electrical apparatus of all kinds interfering with the broadcasting service. If only one or more listeners can prove such apparatus interferes with their reception the owner of the offending electrical plant may have the listener's set altered to overcome the interference at his (the owner's) cost. FRANCE.—According to a report of the luncheon given in Paris to M. George Bonnet by the National Association of Telephone Subscribers, the Minister of Posts and Telegraphs has promised a very extensive programme of telephone development both at home and with the French colonies. The final propositions are for the erection of a long range wireless station on the Atlantic coast for telephone communication with ships at sea up to 1,250 miles and a powerful broadcasting station which would enable French colonies to hear programmes from France with ease. GERMANY.—Berlin's new radio station, says Reuter's, is to have two towers, each 328 ft. high. They are to be erected in the western part of the city and will be constructed of wood entirely, like that of Mühlaacker, as

the absence of metal materially reduces atmospheric. The aërials will be of the "basket" type. The number of German broadcasting licences on Jan. 1 last was 3,509,509. Experiments are proceeding in Hamburg in connexion with the transmission of piano music without using a microphone. According to Messrs. Philips Lamps, Ltd., the string vibrations are directly converted to electrical vibrations and fed to the transmitter. Tests are also being made to ascertain whether the principle can be applied to other musical instruments. *Interference.*—The increasing number of complaints of interference with radio broadcasting reception by electric tramways and other electrical installations has been taken up very seriously by the German Electro-technical Engineers' Association, says *The Electrical Review*. This organisation has appointed a committee which appears to be thoroughly representative, and includes the Post Office, the Broadcasting Co., the electric power stations, electrical manufacturers, Radio Manufacturers Association and the traffic undertakings. A regular wireless (telegraphic?) service between aeroplanes in flight and ground stations is now in full operation on the Berlin-Dresden-Prague-Vienna route.

GREAT BRITAIN.—We understand from the *Wireless Trader*, with reference to the replacement of radio apparatus rendered unsuitable by change-over from d.c. to a.c., that the Tilbury Urban Council has decided to offer each user of a mains-operated set a rectifier of an output of 20 ma., or, alternatively, a cash payment not exceeding £2 in full settlement of all claims. On the other hand, the Burnley Electricity Committee has refused to accept any liability, but suggests arbitration. *Wheatstone slip on the line once again?*—Owing to the difference of time between Great Britain and many of her colonies there is a growing and obvious difficulty in the matter of synchronising some of the best broadcast programmes for reception in this country and, let us say, Australia. *The Electrical Review*, however, states that it is reported that the B.B.C. have acquired recording apparatus by means of which broadcast items can be recorded on a thin wire while it is being passed at a constant speed between electro-magnets. This wire could be hung up until long after we Londoners had gone to bed, and could then be re-passed, but in the reverse direction, through the same apparatus at any subsequent time convenient to the time-table of our overseas brethren! *Broadcast Exchanges.*—In the suburb of Bowes Park, London, the first exchange of this kind in the northern part of the great capital was opened early last month with 250 subscribers.

HUNGARY.—This little country has perhaps the largest exchange of this type in Europe, as there are no less than 9,000 subscribers to the wired broadcasting system of what is known as the Telefon Hirmondo. By the way, in addition to this number of licensees, no less than 200,000 were added between Jan. 1, 1929, and December, 1930. As we learn from *World Radio*, this is despite the fact that there are reception difficulties in some parts of Hungary, while it is easier to receive from certain foreign stations than from the home station! It is, however, expected that two new relays of 10 kw. will be opened towards the end of the present year, one in western and one in north-eastern Hungary. **ITALY.**—As is now widely known, the Vatican City radio-telephone—and telegraph, for the plant is adaptable to both telephonic and telegraphic use—was officially inaugurated on Feb. 12. The short-wave transmitter is of Marconi manufacture and operates on 19.84 and 50.26. Call letters H.V.J. **JAPAN.**—The Japanese Government is about to transfer the management of the commercial side of the national telephone system to private hands, and a similar transfer of the management of the telegraph service is also being considered. **MOROCCO.**—A 7-kw. short-wave radio transmitter is being erected in Morocco for communicating with France. The transmitter will be at St. Assisse and the receiver at Villecresnes, says *The Electrical Review*. **POLAND.**—A 14-year-old schoolboy of Michalkowitz, in Upper Silesia, says the *Exchange Telegraph*, when adjusting a wireless receiving set connected with the electric light system of the town, was electrocuted. He placed one of the wires in his mouth to secure better reception! **PORTUGAL.**—The *Radio Maritima Portuguesa Limitada* is the name of a new company

which has lately been organised in Lisbon to organise a wireless communication system between ships flying the Portuguese flag. **RUSSIA.**—According to the *Izvestia*, plans have been completed for the construction of powerful radio-stations at important centres of the Soviet Union, says *The Electrical Review*. The proposal is to erect 11 stations of 100 kw. and 38 of 10 kw. to be finished at the end of the five-year plan. To a 500-kw. station at Noginsk (Moscow) will be added a short-wave kw. station. The total cost is estimated at nominally £9,000,000. At the moment the new station of 75 to 100 kw. at Kolpino, near Leningrad, is being perfected and, according to the *London Times*, "will soon be functioning."

TASMANIA.—Mr. H. B. Browne, Director-General of the Australian Postal Service, giving evidence before the Public Works Committee, said that the Postal Department preferred the submarine cable to wireless for a telephone service with Tasmania. "It gave greater secrecy," he said, and added "more continuous service, and was the system by which the whole of the telephone needs of Tasmania could best be met." One wireless channel of communication would not be sufficient in the first year.

U.S.A.—"The most trying year in the history of the trade," is the description applied to 1930 by American radio manufacturers. *Visual Broadcasting.*—According to the *T. & T. Age*, the Federal Radio Commission has adopted the recommendation of the recent television engineering conference regarding the reallocation of the assignments of the 19 experimental stations so as to afford greater geographical separations and eliminate interference on the short-wave channels. Other proposals of the conference are now being considered by the Engineering Division of the Commission and will probably be likewise recommended for approval. This realignment of visual broadcasting stations is expected to aid in the experiments and to hasten the day when the art will be ready for public entertainment on a commercial scale.

Broadcasting facilities in North and South America.—At the beginning of the year there were 615 broadcasting stations licensed to operate in the United States. To these are to be added, Canada, with 70 stations, Cuba 60, Mexico 35, a few in Central America and the West Indies, which brings the total, for what may be called the North, to close upon 800. South America, according to the Department of Commerce, has a total of just over 100, which includes Argentina 43, Uruguay 26, Brazil 23 and Chile 6.

A Telegraph Service.—A telegraph service is not what you see from the railway train—poles and wires. They are incidents, and it is all you see. The real underlying value of a telegraph service is in the devoted men and women who are trained in it. . . . I mean that element of devoted service which only comes from the spirit of the telegraph business or any other public service.—*Newcomb Carlton*.

J. J. T.

DISPLAY OF TELEPHONE APPARATUS AT MESSRS. SELFRIDGE & CO., LTD., OXFORD STREET, LONDON.

By the courtesy of Messrs. Selfridge & Co., Ltd., a display of telephone apparatus, &c., which proved to be of great interest to the public, was given during the week ended Feb. 20 in one of their main windows in Oxford Street, which they were good enough to dedicate to the London Telephone Service for that period. In addition, Messrs. Selfridge & Co. provided accommodation for a working model of the automatic telephone system.

An article describing this display, together with a photograph of the window, will appear in the next number of this journal.

*The last word
in
efficiency.*

THE
GE@PHONE
HANDCOMBINATION TELEPHONE



THE GENERAL ELECTRIC CO., LTD.
TELEPHONE WORKS ——— COVENTRY.

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TELEGRAMS: SPRINGJACK, COVENTRY.

LONDON OFFICE: MAGNET HOUSE, KINGSWAY, W.C.2.

BRANCHES AND AGENCIES THROUGHOUT THE WORLD.

Automatic Metering—Symbol of Strowger Efficiency

ONE of the exclusive advantages of the Strowger System is its high efficiency with which it utilizes every unit of apparatus. This is made possible for two reasons: first, the small unit design is a basic principle of the Strowger System; and second, the complete automatic metering facilities which it offers.

With the accurate and complete metering for all groups of switches possible with Strowger operation (the accompanying illustrations show some of the types of meters used), density of traffic and overflow conditions can be recorded for each group of switching units. With such information every switch can be made use of to the best advantage. Due to the small units used, switches from one group can be shifted to other groups where the traffic is heavier, and new units can be ordered one by one as traffic increases—thus utilizing all equipment to a high point of efficiency, and avoiding the necessity of tying up capital in apparatus which must stand unused for long periods of time.

Forty years of development are behind the Strowger System, and it has made possible the effectiveness of the present equipment. Efficiency and profits go hand in hand, and the high reputation attaching to the name Strowger is due in great measure to its successful attainment of these two important objectives.

Automatic Electric Inc.

Manufacturers of

STROWGER AUTOMATIC DIAL TELEPHONE AND SIGNALING SYSTEMS
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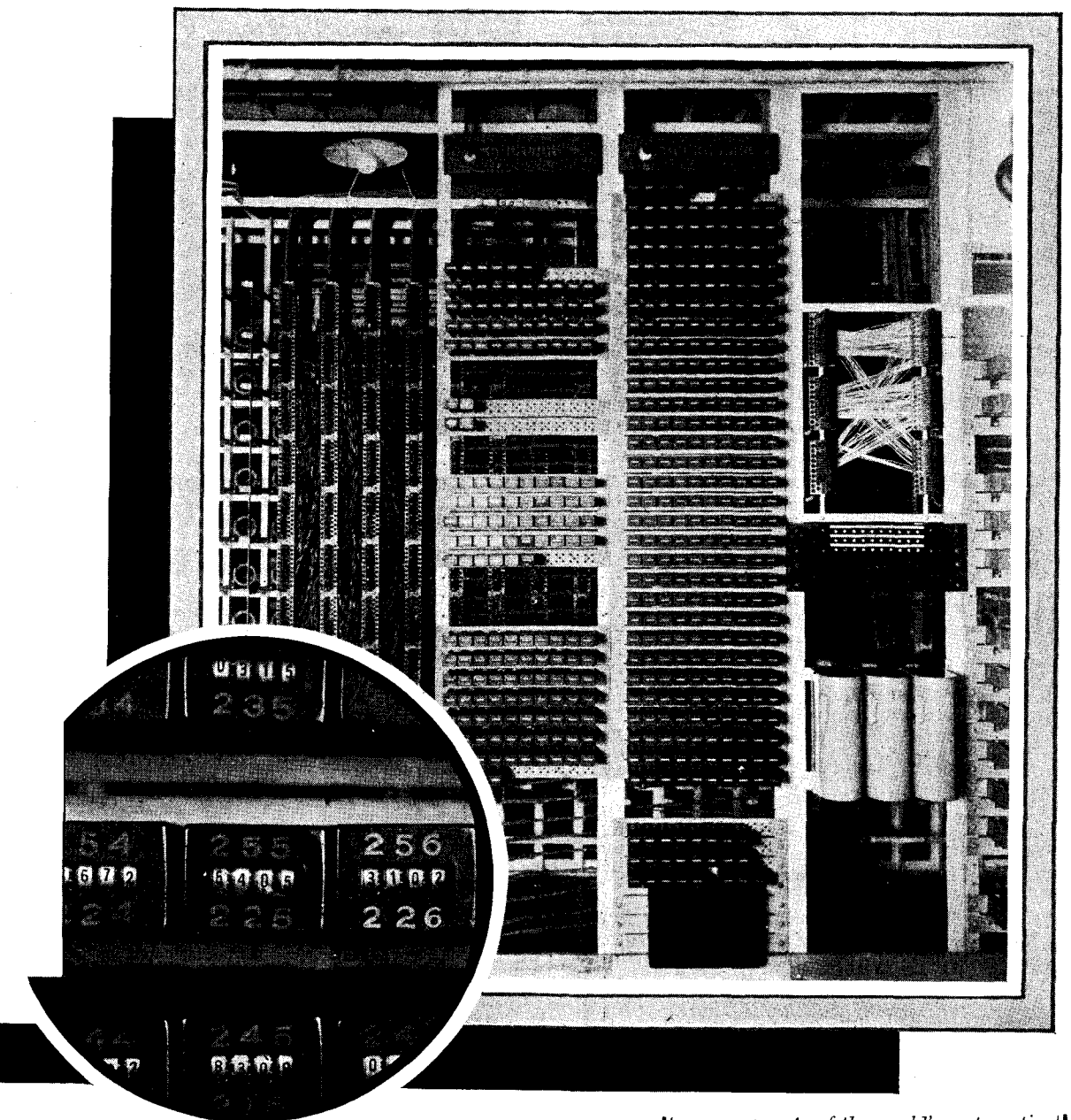
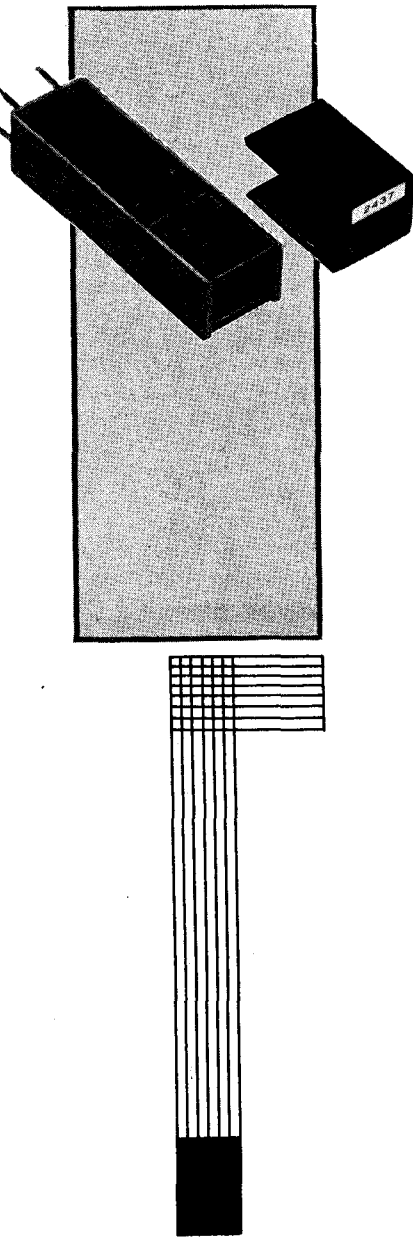
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CONFERENCE OF TELEGRAPH SUPERVISING OFFICERS.

CONFERENCES of Telegraph Supervisors, which are arranged periodically by the Headquarters Telegraph and Traffic Section, are usually held in London, but this practice was departed from on the occasion of the most recent Conference, held on Wednesday and Thursday, Feb. 11 and 12, when Leeds was chosen as the meeting place. Telegraph chiefs from all the large offices of Great Britain and Northern Ireland attended and the opportunity was taken to view the Leeds telegraph instrument room, which was re-arranged and equipped in October last, in conformity with recommendations made by the Commission of Enquiry, headed by Mr. Simon. The facility thus afforded of seeing up-to-date procedure actually in operation was most helpful during the discussion of present and future policy.

The value to the telegraph service generally of these gatherings, however, is not wholly confined to the discussions and the conclusions arrived at during the two days of the Conference for personal contact between local and headquarters administrators in a more or less informal atmosphere (to their mutual advantage) cannot be over-estimated. The life of the Conference commences some days earlier, when a lengthy agenda is in the hands of each delegate, accompanied by papers on the main subjects carefully prepared by experienced officers who subsequently personally submit them for consideration at the Conference proper.

Obviously, local chiefs who will attend consult their immediate colleagues, for they invariably bring and express to the Conference not only their own views and the consensus of local opinion, but also the judgment of others whose views they value, even though sometimes they may not be in agreement with them. Travellers from London, associating earlier, continued their conversations on Conference matters throughout the journey, even an invitation from a railway attendant to listen-in *en route* on the recently inaugurated railway wireless service failed to create a diversion. Such an innovation, new to most of us, was apparently of less importance than those we were discussing.

On the evening prior to the Conference, due to some excellent staff work on the part of Lt.-Col. Jayne, Mr. Bownass, Asst. Postmaster, and Mr. Mansell, Chief Telegraph Superintendent, all the delegates and headquarters officials were assembled to meet, very informally, the Leeds Telegraph Chief Superintendent and the Assistant Superintendents who were to guide them through the intricacies of the new instrument room lay-out on the following day. An atmosphere of cordiality was thereby established which lasted throughout the visit. Old friendships were renewed and local controlling officers who had not previously met in the flesh were able to form personal acquaintanceships which surely will be to the benefit of the service.

The scheduled Conference commenced on Wednesday morning, under the chairmanship of Mr. J. F. Edmonds, supported by Messrs. H. F. E. Deane and F. Riley, with several telegraph traffic officials in attendance. Major H. F. Sambrook, the recently appointed Assistant Secretary of the Inland Telegraph Branch, was present throughout, obtaining first-hand knowledge of telegraph officials and their views. Messrs. H. G. G. Welch, W. D. Waterfall and A. H. Bailey represented their respective branches.

Mr. T. P. Hobbins, Surveyor of the North-Eastern District, was also present. Lt.-Col. Jayne and his local chiefs, together with Mr. J. W. Atkinson and Mr. Crompton, of the Engineering Department also attended. Immediately following the introductory remarks of the Chairman and Major Sambrook, business was started.

Each paper was taken as read, but was amplified by its author. To describe them all in detail is not within the scope of this short article, although only four papers were presented. What stood out was the close relationship between them.

The papers dealt with the following subjects:—

- Teleprinter Development.
- General Telegraph Staffing Matters.
- Revised Lay-out of Leeds Instrument Room.
- Telephone-Telegram and Phonogram Working.

They covered together the tremendous change in working methods which present policy dictates. Extension of teleprinter working to all the larger offices and extension of telephone working to all the smaller offices is to eliminate morse operating. For the time being offices with traffic between 70 and 150 telegrams daily will continue with morse circuits, but eventually will be absorbed into a telephone-typewriting group. To the delegates it seemed that they were attending the burial of morse telegraphy, yet, having lived with it all their official lives, it was remarkable that no deep regrets were expressed and not a single voice was raised in favour of its retention. The high-priests of morse and wheatstone, many of whom a few years ago were probably obstinately confident that those means of transmission were still the best, and in any case would last out their remaining years of service, accepted as inevitable the change-over to new methods.

As regards new teleprinter staffing standards, and a decision to increase experimentally the single circuit standard to 70 telegrams per hour on the Leeds circuits as a step towards an all-round standard of 80, some doubts were mentioned concerning the ability of a number of the older operators to reach such figures. A lucid explanation of the staffing basis by Mr. Riley satisfied some delegates who were apt to confuse staffing standards with average operator output and were apprehensive regarding their own offices.

A conducted tour of the newly equipped instrument room on Wednesday afternoon, and Mr. Mansell's amplification of his most usefully descriptive paper on the new lay-out given on the following morning, went further to convince that the 70, and later the 80, standard will be attained. Wider gangways of 5 ft. 6 in. between instrument tables and not less space than 5 ft. 6 in. in table length for teleprinter circuits having been agreed to, with comfortable seating and good lighting, it was realised that good operating conditions, following the specialised training which was being inaugurated, would go far to encourage high-speed operating.

The typewriter was welcomed in place of hand transcription and asked for even in offices with only a small delivery, so that all operators once trained in type-keyboard should be kept in touch and available for general keyboard work at any time. Periodical inspection of style and method of operating was suggested, so that a high standard of correct touch typing should be maintained.

The necessity, also, of a high standard of maintenance was stressed, both of lines and apparatus; with conditions providing a minimum amount of noise, particularly where telephones are in use, equally good in the smaller and larger offices.

Improved telephone transmitters and receivers, with valve amplification for reception, and new devices for reducing unnecessary noise, were looked upon favourably and their use is likely to be extended.

The replies made by Messrs. Ogilvie and Still, regarding the points raised in the discussion of their respective papers, with a close summing up of each discussion by the Chairman, were all reassuring, and generally, in spite of depleted traffic in comparison with previous years, optimism was noticeable right through the Conference.

New machinery has brought new interest, and there was every sign that everything possible was being done not only to improve output, but to reduce office drag and delay in delivery to the public. Overhead belts did not find favour and belt carriers slightly above floor level are to be tried as an alternative between instrument and circulation tables, but double tables with table belts once seen were unanimously approved, as also was the

segregation of testing and duplex balancing apparatus on panels away from instrument tables.

The interest in discussion continued unbroken right up to the conclusion of the conference on Thursday afternoon. Every delegate present had an opportunity to, and did express his views. Local conditions, naturally, were, in the mind of each, but the national programme was always a guiding factor, and local rivalry in speeches did not exist.

Whoever was responsible for arranging the seating of delegates did it artistically. Liverpool rubbed shoulders with Manchester, with Birmingham in close attendance, Edinburgh fraternised with Glasgow, Cardiff with Swansea, Aberdeen, Hull and Grimsby were in one net. Speeches varied in length, but were all to the point. Some individuals have the gift of fluency, but in such a meeting it is the material contributed rather than style of delivery which matters. The less experienced speaker may be the most efficient administrator, and it was undoubtedly a meeting of administrators of experience and sound judgment. Perhaps it had a wider interest than any previous conference of its kind, as the problems under review, comprising as they did a new national programme for the working of the telegraph service, affected all offices irrespective of size or volume of traffic. Changes proposed at the smaller offices were to affect some of the largest, and it was the dovetailing of the different schemes which made them so attractive as a whole.

Altogether it was a highly successful conference and the delegates separated with a fuller appreciation of the needs of the service, and the personalities and local difficulties of their supervising colleagues at other offices. They gathered much useful information that will help in the establishment of the new and more efficient service in the achievement of which the Conference will undoubtedly be of much value.

The arrangements made for the convenience and comfort of those attending the Conference left nothing to be desired and this word of appreciation is due to Lt.-Col. Jayne, Mr. B. Bownass, Assistant Postmaster, and the whole of the Leeds Telegraph Supervising Staff. Before we departed Lt.-Col. Jayne made the suggestion that the next conference should be held in the same Yorkshire city. For some reasons a most excellent proposal.

C. H. B.

PROGRESS OF THE TELEPHONE SYSTEM.

THE following is a brief review of the growth in the British Post Office telephone system during the year 1930.

The total number of stations working in the Post Office system at Dec. 31, 1930, was 1,957,690, representing an increase of 109,222, or 5.9% for the year. The figures for London, England and Wales (excluding London), Scotland and Northern Ireland separately are as follows:—

	Total No. of Stations.		Increase.	
	At	At		
	Dec. 31, 1929.	Dec. 31, 1930.	No.	%.
London	661,977	703,232	41,255	6.2
England and Wales (excluding London)	999,529	1,058,266	58,737	5.9
Scotland	164,125	171,684	7,559	4.6
Northern Ireland	22,837	24,508	1,671	7.3

Residence rate installations at Dec. 31, 1930, numbered 177,553 in London and 275,724 in the Provinces, the total of 453,277 representing an increase of 36,981, or 8.9% for the year. The increase in business (subscribers') exchange installations for the same period was 21,486, or 3.3%. At Dec. 31 last, the percentage of residence to total exchange subscribers was 49.9% for London, 35.6% for the Provinces and 40.1% for the country as a whole, compared with 30.5%, 22.8% and 25.1% respectively at July 1, 1922, when the lower tariff for residence subscribers was introduced.

The total number of call offices (including kiosks) at Dec. 31, 1930, was 33,855, or 3,931 (13.1%) more than at the end of the previous year. The London total was increased from 5,803 to 6,608, and the Provincial total from 24,121 to 27,247.

Of the net addition of 3,931 call offices for the year, 2,152 (54.7%) were kiosk call offices. At Dec. 31 last, kiosks in London numbered 2,161, and in the Provinces 7,532, giving a total of 9,693, which represents a 29% increase for the year.

During the year 1930, 177 new rural exchanges were opened, bringing the total number opened under the development scheme authorised in 1922 up to 1,549. In addition to the 1,549 exchanges opened, there were at the end of the year 106 others in course of construction.

The number of rural party line stations working at Dec. 31, 1930, was 9,402, as compared with 10,322 a year previously. The reduction is largely due to their replacement by exclusive lines in connexion with the opening of rural automatic exchanges.

Further considerable progress was made during 1930 in connecting rural railway stations with the telephone exchange system, the number of stations connected at Dec. 31, 1930 being 1924, as compared with 1,470 at the end of 1929. All the new circuits provided during 1930 were call office circuits.

The number of effective calls originated during the year 1930 is estimated at 1,350 millions, or 34 millions (2.6%) more than the total for the year 1929.

At the time of going to press, the results for the last two months of 1930 in respect of trunk calls were not available, and the years' figures will be given in a later issue. Particulars of the October traffic, which have not yet been quoted, are as follows:—

The total number of inland trunk calls dealt with was 10,583,089, representing an increase of 302,980, or 3%, on the October, 1929, figures. Outgoing international calls numbered 51,077 and incoming international calls 53,450, as compared with 51,708 and 56,224 in October, 1929. (The latter figures were unusually high owing to the American financial crisis.)

Further progress was made during the month of January, 1931, with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Leytonstone, Whitehall (manual); Frobisher, Gladstone, Gulliver (automatic).

PROVINCES—Crawley, Morecambe (manual); Newcastle—Main—Benton, Gosforth, Low Fell: East—Felling, Jarrow, Wallsend: West—Gateshead, Kenton, Whickham (automatic); Gara Bridge (Kingsbridge), Great Hockham (Thetford), Ilketshall (Bungay), Matlaske (Holt), Monymusk (Inverurie), Mossyard (Newton Stewart), Newburgh (Aberdeen), South Repps (Cromer), Sticklepath (Okehampton), Tarbolton (Ayr), Tedburn-St.-Mary (Exeter), Thrybergh (Rotherham), Waterbeck (Lockerbie), Wivelsfield Green (Haywards Heath) (rural automatic),

and among the more important exchanges extended were:—

Crossgates, Felixstowe, Leek, Weybridge, Windsor.

During the month the following additions to the main underground system were completed and brought into use:—

Manchester—Chester,
London—Clapham Common,
Newcastle-on-Tyne—Ponteland,
Cannock—Stafford,
Dunstable—Leighton Buzzard,

while 70 new overhead trunk circuits were completed, and 72 additional circuits were provided by means of spare wires in underground cables.

CORRESPONDENCE.

"DEMAND" TRUNK WORKING.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir.—The report of the Commission to the United States to investigate American Methods of Handling Long Distance Trunk Traffic, provides interesting reading, but one cannot help wondering whether what has been omitted would not be equally, if not more, interesting.

The impression left by the first reading (at any rate, upon the mind of a backwoodsman of England) is one of bewilderment. Operators, Equipment and Junctions follow each other in a prodigal medley, reminiscent of a Traffic Officer's dream after a heavy supper. At the end of it all follows a period of mental indigestion. Then the backwoodsman takes his little daily dose and starts in again at the task of fetching it all down to this World of Wonderful Reality—which is England as he knows it.

Searching for points of contact, one lights first of all, upon the analogy drawn between the American system and the Special Control method introduced in 1929, covering London and the Home Counties. It is stated that in America no change was made in the standard of trunk provision in advancing from "Delay" to "No Delay" methods, and yet the overall speed of connection was reduced from 13.6 minutes to 2.4 minutes. And this notwithstanding a high percentage of calls accepted by name, wherein directory work takes place during the progress of the call. It is claimed that the experience in connection with the London Scheme was similar. Well, one cannot check the American claim save, perhaps, against the naive admission in one part of the report that "there has been a tendency to pick up spares in advance of requirements as justified by the standards." But one can comment on the English case. The London Special Control Scheme was inaugurated in stages commencing in June, 1929. In July that year, another project was set on foot to provide additional circuits to and from London to improve the standard of service on routes where a margin of spares existed, in the hope of attracting additional traffic. Under that project, over twenty additional trunks to and from London were provided in one district alone—and that a small one. The increase amounted to over 25% of the total already existing on "Delay" routes. Assuming the same to have operated all over the Special Control Area, the total number of circuits added must have been considerable. There is not the slightest doubt that the addition of those circuits has had a material bearing upon the initial success of the Special Control Scheme. One might draw an analogy between this and the American "tendency to pick up spares in advance."

Now although, in individuals, living ahead of means usually leads to bankruptcy, there are undoubtedly times and circumstances when discounting on the future is sound business. But, in such cases, it is essential that one should be under no delusions as to facts, and that an endeavour should be made to measure carefully what the future holds.

Let us, then, face the fact that, just as the London Special Control Scheme, and apparently the American Demand System, have meant a drawing upon the future, so also will any attempt to apply a Demand system to England generally mean a further drawing in advance.

Can we hope to justify that advance by future results? And, by results, one means not merely "service" results, but also financial results. For it must be remembered that, much as we would like "Service" to be our only watchword, there are always those lovers of private enterprise who watch our finance jealously.

It is easy, of course, to say that what has paid in America will pay in England, but that is to ignore entirely the essential differences between the two fields.

America commenced to introduce the new system about 1920. No figures are handy, but one may surmise that, even then, the telephone density in the States was considerably greater than that of England to-day. Moreover, the War had recently finished leaving America strong and free and Europe bound and in pawn. With a vast natural reservoir to draw upon, a commanding financial and economic lead, and a world's trade to be won, was it any wonder that America took the line of inflation and high wages, and embarked on a mass policy of "small profits, quick returns"? The kind of industry that gives the razor free if only one will buy the blades! And in this policy of quick returns what more natural than that the telephone, already handy, should be pressed more and more into the whirl to get ahead of everyone else? Obviously, with inflation (which is another form of taking up spares in advance) the order of the day, it was sound telephone policy to take advances on the future also, and snatch what was going while the going was good by catering for the rapidity of the time.

Turning now to our own country what do we find? First, the impoverishment following the War, with the industrial side hopelessly depressed by the policy of deflation, low wages and cost reduction ordained by the banks in their fight to regain financial supremacy. Second, a small field which can never hope to compete with America in rapid mass production. Third, a

low telephone density. The general policy of English industry has always been, and is now, "large profits on small turnover." It is a policy which, having its roots in the conservatism of the people, has been fostered by general conditions, and by the dominance of a financial power having no prime concern in the condition of the nation. It is a policy which does not make for telephone calls—a leisurely one, for which the post is good enough. And there is, as yet, no sign of a reversal. There was a short brisk spell following the War whilst a void was being filled. The telephone participated, but with the filling of the void, and the descent of deflation, there has been a slackening.

It is of little use for the Telephone Service to try to create an artificial demand. The effects of such attempts may be seen now to some extent in cessations, bad debts, and lagging development. The Service must follow closely the general trend of industry, and the present is hardly the moment to embark on any extensive policy of borrowing on the future.

And now as to the reason for this jeremiad! It is in the slight hope that it will constitute something of a corrective to certain roseate views wherein, it is suspected, wishes are fathers to thoughts. Already, during the past few years, there have been too many swings of the pendulum, first towards "no-delay," then back to "delay," and now to "no delay with reservations." If we are to have a policy let us have one which is whole and not in patches; one which can be adhered to steadily and progressively; one free of illusions, and which will not involve a sudden *volte face* towards economy such as we have recently suffered on one side of our house—right-about which overturn in a moment any beautiful edifice laboriously erected on illusions.

Canterbury,

Jan. 29, 1931.

A. E. TANNER.

[We print Mr. Tanner's letter in full, but we feel bound to make a few comments on some of the inaccuracies and misapprehensions it contains.

He seems to confuse "Demand" working with "No Delay" working, the difference between which should by this time be obvious to officers who have been supplied with the Report referred to.

As regards the introduction of special control in the London area in 1929, the date of commencement quoted is incorrect as is also the statement that the additional circuits provided had any bearing on the initial success of the scheme. These were in fact, brought into use *after* the scheme had carried the 1929 season traffic.

The "Demand" system was introduced in the United States in 1925. Perusal of paragraph 8 of the Report would have made this clear.

We may observe that the fact that American and British economic conditions differ to some extent need not preclude the Post Office from continuing their policy of developing and improving their service on lines which they are satisfied are economical.

Finally, that which Mr. Tanner, doubtless from his unique sources of information, decides is a *volte face* on the part of the Administration merely amounts to the trying-out of processes and modifications incident to all far-reaching schemes of improvement. There has been a definite trend towards the policy of setting up trunk calls on demand, which has been consistently followed and will continue to be followed, subject to technical difficulties being overcome.—ED., T. & T.J.]

ABERDEEN NOTES.

THE annual dance of the P.O. Engineering Department was held in the Douglas Hotel on Jan. 8. It was the universal opinion of the large company present that this year's function outshone even last year's successful effort. Amongst those present were Mr. J. B. Glover, Sectional Engineer, and Mrs. Glover, who kindly presented the lucky number dance prizes. We were sorry to hear Mr. S. A. Young, District Manager, was indisposed and, therefore, unable to be present. The committee are to be sincerely congratulated on the results of their efforts.

The Aberdeen telephonists' annual dance was held in the Douglas Hotel on Friday, Jan. 30. Between 50 and 60 couples were dancing, and all agreed that the dance was one of the most successful that has yet been held. Mr. Webb, Asst. Traffic Supt., presided at supper, and after apologising for the absence of Mr. Young, the District Manager, who was unable to be present owing to a recent illness, he extended a welcome to the guests and congratulated the committee on the excellent arrangements they had made. The dance closed at 1.30 a.m. with "Auld Lang Syne."

We very much regret to record the death of Miss Napier, Supervising Telephonist, Arbroath, after a short illness. Miss Napier was one of the oldest telephone servants in the district and would have been due to retire in two years' time.

She operated at the first switchboard installed in Arbroath by the National Telephone Company. Miss Napier entered the service of the company in April, 1890. Her father canvassed the first telephone subscribers in Arbroath.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

It is interesting to note that, in spite of the present conditions of trade, the business done by the Contract Branch during the month of January, resulted in a net gain of 5,609 stations as compared with a net gain of 5,596 stations in the corresponding month last year.

The demand for the popular hard microphone instrument continues.

Something like 32,000 have already been ordered in London and since the beginning of the year the number ordered has more than doubled itself.

Subscribers' views on the telephone service are always interesting; the following is an extract from a correspondent's letter:—

"The telephone was promptly moved and friends who rang up our former number were courteously switched to our new one. This was all done in the friendliest way and with a conspicuous absence of official arrogance."

A complainant, not a telephone subscriber, in a letter consisting of a choice collection of anagrams concludes in this way:—

"I only hope it is possible for you to call round and 'rectify' my statements."

It must be recorded as a rare treat to be *invited* to correct a correspondent's statement, but, in this case, we do not think the request was really intended as a challenge.

L.T.S. Contract Officers Annual Dinner.

The London Telephone Service Contract Officers held their second Annual Dinner on Friday, Jan. 23, at Ye Mecca Cafe, Ludgate Hill.

A company of about 100 sat down to an excellent dinner.

Mr. J. W. Marshall, the President of the Contract Officers' Association (London Branch), presided. The guests included Mr. C. Edwards, a retired former Branch Chairman and Mr. Sidney T. Gamlin, the General Secretary of the Association. The Toast of "The Association," proposed by Mr. A. E. Culpin, was replied to by the President. He referred to the honourable position held by Contract Officers in the Telephone Service in their daily contact with the public and went on to say that every Contract Officer had it within his power to show the need, value, and importance of the telephone in the life of the country.

An excellent programme of music was arranged by Mr. West, of the Western Contract Office and his orchestra and during the evening a variety of musical items were rendered by members of the staff.

As is customary on such occasions the versatility of one's colleagues and hitherto unknown talents were displayed in various ways and songs were contributed by Messrs. Cummings, Pearkes, Gathercole, Odey and Armes. Mr. Luing rendered a cornet solo and Mr. L. Fergusson's pianoforte playing was delightful. Mention should be made of the original and witty musical monologue on the daily round of a Contract Officer's life by Mr. S. G. Harris, which afforded an opportunity for the company to join in, which they did with great gusto.

The organising Committee are to be congratulated on the thoroughness of the arrangements and thanks are due to those who contributed in any way to make the evening so enjoyable.

London Telephone Service Sports Association.

The arrangements for the Annual General Meeting are now well in hand. Monday, April 13, has been fixed for the date and the Meeting will be held in the Cornwall House Refreshment Club, at 5.30 p.m. A representative from the Civil Service Sports Council will attend and this year Mr. Noel Curtis-Bennett, C.V.O., has been invited to address the gathering.

Business will be followed by a Social and Concert as upon previous occasions. Further details including copies of the Annual Report, Balance Sheet and proposed new Constitution will be issued later.

Athletic Section.—The next Sports Meeting is to be held at Chiswick on Thursday, June 4, at 5 p.m.

The Committee are now engaged in drawing up a list of events which will be published shortly.

Dinner to Mr. W. H. U. Napier, C.B.E., and Mrs. Napier.

A function of a most pleasant nature and happily unattended by "the sadness of farewell," was held at the Florence Restaurant, on Jan. 30, when a number of colleagues entertained the Controller, his wife and daughter, Moira, at dinner to celebrate Mr. Napier's appointment as Commander of the Most Excellent Order of the British Empire.

The Deputy Controller, Mr. M. C. Pink, was in the Chair, and when proposing the toast of our guests' health was able to prove conclusively that throughout Mr. Napier's career, events over and over again pointed to his ultimate attainment of this high honour. To begin with, when at an early age Mr. Napier joined the National Telephone Company, his motto was to make the "(C)ompany (B)rilliantly (E)fficient." Then, on his transfer to the Metropolis finding that London even in those days, had a "guid conceit o' hersel," he sought to lead her in the paths of humility with the motto:— "(C)onceit (B)arred (E)mphatically." "Again," said Mr. Pink, dropping his voice, "when I had the privilege of accompanying Mr. Napier to America, I noticed a marked characteristic which enabled him to succeed in that difficult pursuit—always to get what he wished—and that was summed up in these words '(C)an (B)larney (E)asily.' Here in London, seeking a perfect service, our Chief will help and encourage the staff by every means in his power, because '(C)o-operation (B)rings (E)fficiency,' especially when backed by the '(C)ontroller's (B)oundless (E)nergy.'" (All of which seemed to show that it was written in the stars many moons ago that the sun would shine on our chief and that the King would be graciously pleased to honour him.)

Mr. Pink then asked Mr. Napier to accept a gold cigarette case, which bore the following inscription:

Presented to
W. H. U. NAPIER, Esq., C.B.E.,
as a token of friendship and goodwill
by his colleagues in the
LONDON TELEPHONE SERVICE
on the occasion of his appointment
as Commander of the Most Excellent Order
of the British Empire.
January, 1931.

The toast was accorded musical honours and the applause, long and sustained, gave proof of the regard felt for the Controller.

Mr. Napier was in the happiest mood in replying and kept the company in delighted laughter by his many shrewdly humorous references to persons and things encountered in his long association with telephone men and women.

Was it by accident or design that, just as Mr. Napier was making a careful reference to his own and the Deputy Controller's experiences in America a distant orchestra struck up—

"Who wouldn't believe those lips?
Who ever could doubt those eyes?
The night that he told me
Those little white lies."

Musical numbers were given by Miss Bessie Jones and Mr. David Evans, who both sang very sweetly. They were accompanied by Mr. Edgar Jones and Mr. Walter Badham entertained the company with humorous sketches and songs.

Mr. Tinniswood and Mr. Dive honouring the tacit understanding of "Brevity" took this too literally and were disappointingly brief. Mrs. Napier was presented with a basket of flowers, her daughter with chocolates, and the evening's entertainment ended with a whole-hearted rendering of "Auld Lang Syne."

A very pleasant gathering, and one that will be long remembered.

J. McM.

The London Telephonists' Society.

On Feb. 6 the London Telephonists' Society held their fifth meeting of the Season, at the Aldersgate Street Y.M.C.A., when Mr. W. C. Griffith gave a lantern lecture, which very interestingly summarised some of the many details of his recent visit to the United States of America, and described the impressions he formed in comparing the American Service with our own.

There are a great number of the members of this Society especially those attached to Exchange Staff, to whom this meeting proved the occasion of an introduction to Mr. Griffith, who has come, comparatively recently, to the London Telephone Service. It was a great pleasure to hear a lecturer who so firmly held his audience by the impression of enthusiasm for his subject, that Mr. Griffith exhibits. Never for a moment did one's interest wander, and it was with a sensation of regret that one ultimately realised that the end was reached.

Mr. Pink moved a vote of thanks to Mr. Griffith and several members expressed their very sincere appreciation and thanks; these, in conclusion, were carried unanimously by the entire audience.

The next meeting will be held at the City of London, Y.M.C.A., Aldersgate Street, at 6 o'clock (instead of 6.30, the usual time), on Friday, Mar. 6, when the successful competitors in the annual Essay Competition will read their papers. The Subject is "What I might have been"—and the prize winners are as follows:—

Class A. (Telephonists).—Miss M. Williams, Grosvenor Exchange.
Class B. (Supervisors).—Mr. W. G. H. Cox, N/SR, City Exchange.
Class C. (Other Grades).—Mr. T. A. Oldham, Observation Section.
Miss C. Mease, Girl Probationer, Welbeck Exchange.

In addition, the final trials of the Elocution Competition will be held. The two teams to reach this point are from Temple Bar Exchange and Buckhurst Exchange. The latter team includes entrants from Wanstead and Maryland Exchanges.

The Controller, Mr. Napier, has very kindly consented to present the prizes, and it is hoped that a very large number of members will attend what promises to be a very interesting evening.

Flaxman Exchange.

A most enjoyable evening's entertainment was organised by the Flaxman Exchange Staff at a dance given in aid of the Chelsea Branch of the League of Nations, at the Chelsea Town Hall on the Jan. 23.

It was quite obvious that the hard work of the organising committee met with a well-earned reward in the success of the whole evening. The occasion was the more interesting as several members of the Chelsea Branch of the League of Nations graced the event by being present, including Mrs. Hubert Walter, President, who accepted a bouquet presented by Miss Clement, the Supervisor-in-charge; Captain Green, M.A., the Chairman of the Executive Committee, Chelsea Branch; Miss Mary Selby, Chairman of the Central Group; Dr. Alice Benham, Chairman of the World's End Branch; Miss Muriel MacKenzie, Honorary Secretary and Mr. Eric Branch, Chairman of the Youth Group. The Hon. Mrs. Clay, Chairman of the Sloane Group Committee, and Miss Huntington, J.P., Chairman of the Education Committee, sent letters of regret of their inability to attend.

During the evening Captain Green made a speech explaining the aims of the League in the endeavour to educate Nations against War and all the attendant evils, and expressed his gratification to the Members of the Flaxman Exchange for such an ideal scheme; he congratulated them also on the fact that their splendid efforts had met with such success.

The District Superintendent, Mr. Buckeridge, who was also present, always shows a keen interest in the League; his presence was very much appreciated by all and gave particular pleasure as it is realized his social engagements are numerous.

It is expected that approximately £15 will have been raised from the entertainment for the benefit of the League.

Tilbury Exchange.

A dance organised by the Tilbury Exchange Tennis Club was held at the Tilbury Hotel, on Saturday, Jan. 31, 1931.

The popularity of the event was evidenced by the attendance of nearly 200 persons. A most enjoyable evening was spent and after meeting expenses the sum of £4 10s. 0d. was available for charitable purposes. A cheque for this sum has been forwarded to the Tilbury Hospital Authorities.

Stamford Dramatic Society.

"Murder on the Second Floor," a thriller in three acts, by Frank Poster, will be presented by the Society on Tuesday, Mar. 31, at the Cripplegate Institute, Golden Lane, E.C.1, at 7.30 p.m.

The price of the tickets will be 3s. 6d., 2s. 4d., and 1s. 2d., and they can be obtained from Miss Coleman, London Telephone School, Ironmonger Road, Lever Street, E.C.1.

Personalia.

Promotions.

To Assistant Supervisor Class II.

Miss G. A. Frampton, of Museum.	Miss G. J. Finch, of Gerrard.
" E. S. Anderson, of Museum.	" D. A. Nye, of Victoria.
" V. Harris, of Regent.	" E. M. Johnston, of London.
" K. R. McKeon, of Esher.	" Wall.
" R. O. Bouttell, of Holborn.	" E. P. Hairs, of Hop.
" I. M. Byford, of Hampstead.	" E. J. Davy, of Western.
" E. A. Bowler, of Mayfair.	" R. H. Barrable, of Terminus.
" C. A. Robertson, of Regent.	

Resignations on Account of Marriage.

Telephonists.

Miss G. M. Hack, of Battersea.	Miss L. M. B. Collar, of Shepherd's
" G. A. Edwards, of City.	" D. I. Child, of Sutton. [Bush.
" L. Chamberlain, of City.	" I. F. Sutton, of Trunks.
" W. A. Chuck, of Hillside.	" C. Knight, of Waterloo.
" J. Coxhead, of Hop.	" E. M. Murrell, of Temple Bar.
" I. M. E. Oakley, of Hounslow.	" E. E. Coombs, of Royal.
" G. Munford, of National.	" E. E. Wheeler, of Gerrard.
" N. K. Thomas, of Paddington.	" F. G. Methven, of Central.

TELEPHONE STAFF MEETINGS, BLACKPOOL.

On Wednesday, Jan. 7, two telephone staff meetings were held at the Blackpool Head Post Office and at each meeting there was a large attendance of the supervising and operating staffs connected with the Blackpool, St. Annes, Cleveleys and Lytham Exchanges.

Mr. Morgan, Traffic Superintendent, Class I, presided, and in his introductory remarks explained clearly that the object of the meetings was to allow free and open discussion by the staff of all matters of common interest from a service point of view.

A talk was afterwards given by Mr. Butterworth, Assistant Traffic Superintendent, on "The Call," in the course of which he dealt in detail with the methods adopted in arriving at the Standards of Operating Loads and Service and Valuation of Calls. The importance of service tests to enable the service to be kept under review so that its progress and efficiency may be judged, was also emphasised, and graphs which were exhibited showing the quality of service given at different exchanges in the district proved very interesting.

Various other aspects of the service were touched upon, such as the importance of instilling in subscribers a feeling of confidence that telephonists will do the best for them in all circumstances.

Illustrations of the time spent in dealing with complaints and the cost entailed were given, and the loss to the department's revenue through ineffective calls was also mentioned. In the latter connexion it was pointed out that telephonists can, and should, in accordance with the rules, draw the supervisor's attention to any numbers, either on their own or other exchanges, which are frequently found engaged.

Keen interest was evinced by the staff at each of the meetings, and at the close of the lecture, various points were raised by different members of the staff and a most useful discussion ensued.

BIRMINGHAM NOTES.

Birmingham Telephone Society.—The important changes which will shortly be made in the method of dealing with trunk calls has aroused great interest, and it was evident by the large and appreciative audience which greeted Mr. J. F. Darby, of the Secretary's Office, when he came on Feb. 4 last to give an address, presided over by Lt.-Col. W. T. Brain, on the subject of "The Demand System of Trunk Working" and on the American methods of dealing with Long Distance calls, that the staff was anxious to get first-hand information.

The address, which was illustrated by lantern slides, was so closely followed that the fact that it exceeded the time which it has been usual to allot was not observed, and although Mr. Darby had been speaking for over an hour he was bombarded at the close of his address with a record number of questions, which he dealt with in a manner which his audience keenly appreciated.

NEW YEAR GATHERING OF OLD C.T.O. COLLEAGUES (MALE SECTION).

THE Eleventh New Year Gathering of the above took place at the Express Dairy Private Tea Rooms, Hart Street, Bloomsbury, on Jan. 14, when the record number of 112 sat down for talk and tea. It was just as well that the women folk were absent, for even they would have found it difficult to get a word in edgeways!

Mr. J. Bailey, I.S.O., filled the chair with that wonted ease with which he has always met difficult situations, while Mr. A. W. Edwards, O.B.E., though content to take a more lowly seat, livened the proceedings with one or two choice stories, straight from the golf course!

The thanks of the gathering were heartily accorded to Mr. C. S. Keen and Mr. H. E. Adams, the organisers and managers of these most enjoyable functions, and on the initiative of the Chairman the following telegram was forwarded to Mr. W. S. Fisher, who reached his 84th birthday on Jan. 4, but was absent owing to indisposition: "Old Brigade deeply regret absence from reunion and hope for speedy recovery." News of two others, Mr. A. Morgan (Old Electric Co., 1863) and Mr. H. Clarke, who had both entered the octogenarian stage that month, and also tidings of Mr. J. H. Kirner came to hand at the gathering. The latter tied with Mr. Fisher with 84 not out on the same date. Both were prominent members of the old 49th Middlesex R.V.

It was not possible to read the entire sheaf of letters which Mr. Keen had received recording the regrettable absences of the many well-wishers who, due to varying and unavoidable circumstances, were unable to be present.



The River.

A HEAP of rocks and surrounding it a wide expanse of boulders large and small. Piled unevenly or scattered in disorder, chippings left by a gigantic sculptor. Older than time and with the patience of eternity. Burnt by the sun, cooled by the rain, chafed by the wind, soothed by the drifting mist. Silence, mystery, awe, loneliness. Beneath the summit the sudden grey cliff, scarred, fissured. The short sparse grass touches its foot timidly, then hurries away down the slope fearful of its frown. Fangs of rock jut fiercely as if to impede its escape.

Lower down where the grass is greener a trickle of water has formed a tiny pool. It spills shyly over the lip, it sparkles, creeps through the moss, falls in shallow steps, glistens over a half-covered stone. It lingers awhile, afraid to venture, then gains confidence, and gurgles through a slight channel deeply cut in the soft earth. It steals musically under the arm of a tussock, peeps out, smiles and falls into a quivering pool of purity. It hesitates, then drops daringly, turns, plunges again, tinkling, purring, widening, deepening, splashing noisily, dropping recklessly, spurning where it embraced. Now it is lost, seeping painfully through a bog, now it reappears sliding joyously over the smooth face of a rock into a pool. It tumbles out busily, gushes and spouts between boulders and scrambles excitedly round and over them, carving the soft earth in its impetuous youth. It reaches the foot of the slope, the hot pace eases, it murmurs, teases the pebbles gently, ripples the sand. Cool, clear, pure. So for a while.

But now the pace quickens, its gay ripples smoothe, it becomes tense, the careless abandon of the slope gives place to a grim purpose, impatient it rushes faster, faster; it carves its course fiercely, tears the soft earth, surges past the rocks until with a wild effort it plunges madly into the green twilight of a chasm. It rends itself into a myriad drops, it flings up a gossamer mist, it thunders into the gorge, it swirls, eddies, churns, boils, foams, roars, dashes from side to side, beats in a frenzy at the walls of its prison and then—there is the glimpse of the smiling valley. Bewilderment and passion pass into eagerness and the stream leaps as to a long-sought friend.

It emerges into the sunlight and open sky and steals with ever-increasing gentleness amongst green meadows flanked with low hills, meanders placid and content, touches the sad willow, whispers amongst the reeds, chatters over the shallows, gossips at the ford. It flows through the dim beauty of the woods, passes the humble cottage and the stately mansion. It stops to caress the velvet lawn that reaches down to meet it, pauses to fill the thirsty bucket, hurries to turn the complaining wheel. It bears the proud swan, reflects the blue flash of the kingfisher, gives quiet pools for the trout. It laps sleepily by the boat, carries the lovers on its bosom and listens to their vows. It reaches up the bows of a launch, swings from it in graceful curves, throws playful waves at the banks. It makes way for the barge as for a stout wife with her market basket.

Soon it reaches the wharves with their rattle of cranes, it tosses chips of wood, broken boxes, odd refuse thrown out from squalid alleys. It loses its clear purity, it clouds with mud, strange ships churn its surface. Patches of oil make false rainbows, foul bilge pours poison.

The fussy little launch of sober colour slides up. They pull out something sodden, unlovely, unknown, unrecognisable. Not what it was, not what it will be, not even what it might have been. Waste, hopelessness, despair. Out of the infinite, unburdened by the river, into the infinite. The liner stands out from the stage, the tender has come and gone, the screws revolve, the ship gathers way, she drops down the river into the distance, into the darkness. A tear from the shore falls and mingles unheeded with the flood. It is harder to be left than to leave.

The moon casts a silver beam across the dark flood and the river passes on too, over the bar, out to the sea, from the infinite into the infinite.

PERCY FLAGE.

A Memory of Lauterbrunnen.

EASTER—the season of Nature's resurrection, and the joyful herald of summer—overtakes us before we are aware that the winter is passing; then, with the lengthening days, we look forward to Annual Leave and the holidays we are planning.

Shall we visit a health resort in the British Isles or shall we travel to a foreign land? We look back upon the holidays we have spent at home and abroad to discover where the choice will be. My retrospection brings memories of Switzerland; of an eventful stay in Lucerne and a journey to Lauterbrunnen; where my friend and I occupied most of our time with walking tours. The excursion to the Grindelwald Glacier proved to be great fun!

At lunch on the following day an outing to the Trummelbach Falls was proposed; but, feeling tired after the previous day's exploits, I suggested that my friend joined the party while I remained in the Hotel and rested. After some persuasion she agreed; and the party set out, leaving me seated on the veranda.

The Stubbach Falls on my right glistened in the sunlight as the water fell gracefully down the mountainside; on the left, streams from various directions flowed into a river which gathered force as it proceeded to the nearest lake. Straight ahead were the snow-capped peaks of the Bernese Oberland; while the road outside the Hotel led down the valley through the mountains as far as the eye could see.

I had been reading for some time when my attention was arrested by the sound of music. It came from the school opposite, where the children were singing an evening hymn in German; they harmonised as Swiss children can, and their sweet young voices made soft melody on the clear mountain air. Soon they were free and their gay-hearted laughter rang through the valley. From the forests came those little people so real to childhood—elves, who danced and frolicked with the high-spirited youngsters; fairies who walked beside the more serious-minded—and communed with them.

The children and their dream-companions passed down the road through the mountains, out of sight; and a sense of loss overwhelmed the place where they had been.

I looked up to the mountains. "What strange emotion possesses me!" thought I. "Am I suddenly transported into an unseen world, or do those mountains live? Yes! they had become as living things which had voices; each snow-capped peak joined in a mighty choir to the Spirit of the Mountains: 'How excellent are Thy works in all the world.'" "And every valley shall ring exalted," sang Nature from below. The anthem ended.

A darkness as of night spread a canopy over the sky; the mountains looked sinister, terrible; the valley was wrapped in gloom. Thunder vied with the roar of distant avalanches; lightning—vivid, powerful—struck blow after blow at the mountains; it was as though an Evil One fought and wrestled with them; but they stood formidable in their defence.

Then the sun appeared and spoke to the valley: "The danger is past," he said. "Lift up your head to the Spirit of Light, for His foundations are in His holy mountains."

The vision faded as my friend entered the room. "We've had such a lovely afternoon at the Trummelbach Falls. I do wish you had been with us; it was one of the grandest sights you could ever see!" she said. "Were you caught in the storm?" I asked. "No!" she replied, "we found shelter; somehow storms do not appear to be so bad here as they are in London; the mountains seem to be a protection."

We dressed for dinner and went down; then we made plans for the short time left to us of our holidays. Good things come to an end, and all too soon we were preparing for the homeward journey to England.

Yes! I might do worse than spend a fortnight this year in peaceful Lauterbrunnen.

G. M. T.

Terpsichorean Tudor.

THE Tudor exchange held their first dance on Tuesday Jan. 20, at the Green Man Hotel. The function was very well supported and over a hundred telephonists and friends were present. Mr. G. Ring acted as M.C. and the Rythmusian Orchestra under the direction of Mr. Les Ayling, contributed very largely to the success of a most enjoyable evening. The very favourable reports and comments which one heard not only on the following day but for days after must have been extremely gratifying to the organisers. It does not need a prophetic to predict that the first Tudor dance will by no means be the last—at any rate if one dare not prophesy one may at least hope.

M. E. B.

We are Told That—

A subscriber, having dialled O, complained she was unable to get a correct number. When asked the number she had dialled she replied, "Oh, the number printed on the billhead, Est. 1870."

On challenging a caller in a multi coin-box call office, a telephonist was told by the caller, "My time isn't up yet." The telephonist is alleged to have replied, "You've been in the box three weeks already." She was probably excited at the thought of her approaching three minutes annual leave.

LEEDS DISTRICT NOTES.

Telegraph Supervising Officers' Conference.—The conference which was held on Feb. 11 and 12 was unique in so far as it was the first to be held in the provinces. It was a pleasure to have with us Mr. H. F. Sambrook (Asst. Secretary, Inland Telegraph Branch) and so many old friends, not only from headquarters but also from other provincial centres.

The conference was preceded by a very happy function in the form of a dinner at the Hotel Metropole. Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster-Surveyor), occupied the chair, and Mr. J. Bownass (Asst. Postmaster) made an amusing and efficient M.C. The ice was thoroughly broken and the delegates entered on their more serious labours on the following morning in a happy mood. The pleasant atmosphere continued throughout the conference, and under the able presidency of Mr. J. F. Edmonds the proceedings were conducted in the most harmonious spirit. The local officials were amply repaid for their labours in the pre-conference arrangements by the handsome appreciation of their efforts which was expressed on all sides.

The remodelled Leeds Instrument Room—the “*raison d'être*” of the locale of the conference—received unanimous approval, and at the conclusion of the proceedings on the second day Col. Jayne, in acknowledging the tribute of the Chairman, expressed the hope that the opening of the new Leeds Phonogram Room might be regarded as a good and sufficient reason to hold the conference again in Leeds in 1932.

P.O.E.E. Institute.—The new layout of the Leeds Instrument Room also figured largely in an excellent address on “Telegraphs, with special reference to recent developments in the N.E. District,” which was given by Mr. J. W. Atkinson, M.I.E.E. (Supt. Engineer), to the Leeds Branch of the Institute on Jan. 13. In these days, when “Telephones” seem to be the pet of the family, it was intriguing to see so much attention being paid to the elder sister. The lecturer, who incidentally has experience of telegraphs dating from the “tapper” days, was happy in his subject, and gave the members and friends present an accurate survey of recent developments, which he illustrated by means of excellent lantern slides and diagrams. Col. Jayne opened the discussion in which several members of the meeting took part. There were many admirers of the elder sister, but although they spoke in glowing terms of her early beauty and usefulness, there was a distinct leaning towards her more attractive younger sister, and the conclusion ultimately arrived at was that perhaps after all the younger must take the lead, followed graciously by the elder, if friction in the family was to be avoided.

Staff Dance and Whist Drive.—The third social function of the season was held on Jan. 17 at the Hotel Metropole, Leeds, when a company of 300 spent a very enjoyable evening playing whist and dancing. During the revels we noticed many old friends, among whom were Mr. T. A. Bates (late District Manager) and Mr. W. Tate (late T.S. II), who postponed their “activities” of retirement for more energetic pursuits; and Mr. C. A. Atkinson, who was recently transferred to Birmingham. At the invitation of Mr. J. F. Murray (District Manager) the whist prizes were presented by Mr. Bates, the recipients being Mrs. Taylor, Mrs. Macbeth, Mrs. Paley, and Mr. Tate. The close of the evening found the organisers being bombarded with the request, “When is the next to be?”

Promotion.—A pleasing ceremony took place in the District Office on Friday, Feb. 6, when Mr. W. Knight, Clerical Officer, was presented with a Revelation suit-case, a case of brushes, and an Onoto fountain pen, on the occasion of his appointment to a Higher Clerical position at Sheffield.

Retirement.—To mark the retirement of Mr. J. (Joe) Whelan, Contract Officer, on his 70th birthday, after 25 years' service, a gathering of friends took place at the Devonshire Arms Hotel, Keighley, on Jan. 9, when Mr. Whelan was the recipient of a grandmother clock. The gathering was presided over by Mr. J. L. Blackburn, and the presentation was made by Mr. G. H. Sixsmith, Head Postmaster of Keighley.

A further pleasant little function was held on Jan. 20, when the Contract staff and friends entertained Mr. Whelan to tea in the dining room at Basinghall Street, Leeds, and presented him with a barometer.

The Bradford Telephonists' Staff Dance, held at the Mayfair Ballroom on Jan. 28, was a huge success. The tickets were disposed of in record time and it became necessary to refuse admission to a large number of would-be dancers who arrived optimistically during the course of the evening. Everyone commented on the excellent efforts of the band which so ably helped to make the dance one of the most enjoyable functions of the season.

Although the weather is far from encouraging, preparations are already afoot to reorganise the Bradford P.O. Ladies' Swimming Club for the coming

season. As the late captain, Miss D. Magson, has recently resigned on account of marriage, the post of honour is at present vacant, but the new captain will be chosen at the forthcoming meeting.

Leeds P.O. Football Club.—The replay of the Lancashire and Yorkshire cup tie with the Sheffield Engineers took place on Feb. 14. Favoured with fine weather, Leeds had plenty of supporters who were hoping to witness a good game in view of the record of the home team during the present season. They were disappointed, however, as the Loiners were overplayed from the start of the game, and the result, which was never in doubt, was Sheffield Engineers 2 goals, Leeds *nil*.

WESTERN DISTRICT NOTES.

ON Jan. 21 about 300 merry-makers met in the ballroom of Deller's Café, Exeter, the occasion being a dance and whist drive held by the staff of the Western District Manager's Office which was also attended by some members from the Surveyor's, Head Postmaster's and Sectional Engineer's Offices with some friends. The ballroom presented a very animated appearance, being decorated with coloured balloons and festoons.

A pleasing feature of the event was the spirit of re-union produced by the presence of several ex-members of the staff, many of whom came from Plymouth. The whist drive proceeded in the comfortably appointed Bedford Room concurrently with the dancing. Some members of the staff found time for other diversions, judging from the appearance of the Rest Lounge and main galleries of the Café (fully licensed). The whist prizes were presented by the District Manager, Mr. T. A. Beck, who suitably greeted each prize winner in a manner appropriate to the occasion. Many other prizes were distributed during the evening for novelty events in the ballroom, and so bright and entertaining was the function when the final hour arrived, all too soon, it led to complaints of “disputed duration.”

The promoters are to be congratulated on the arrangements and also for the energy which they displayed in inflating large balloons which were floating about, and on which had been printed:—

“You are on a good line now,
Let your ‘dials’ be bright ones.”

It is understood that the blowing up process was hard and tedious and it must have been mortifying to the committee to see the scrum which ensued when the balloons were produced and to find their efforts exploded in 2 minutes 17 seconds (per stop-watch G.P.O. No. 3—split seconds).

A tale is told that once when a single line of telegraph was being run in a primeval part of Africa the natives clustered around the engineers and exhibited great mirth at the proceedings. The Chief, on being asked what caused all the amusement replied: “Ha! Ha!! Haa!! Big fool white man him put up fence and cows they walk underneath. Ha!!! Ha!!!

“If you want work done go to the man who is already fully occupied, e.g., the Traffic Superintendent.”

Princetown on Dartmoor has been much in the public eye just lately owing to the escape of two convicts from the famous penal establishment. Princetown is so called in honour of the Prince of Wales, afterwards George IV, and it owes its origin to the influence of a certain gentleman—Sir Thomas Tyrwhitt—who was Secretary to the Counsel of the Prince of Wales, and a Member of Parliament successively for Okehampton and Plymouth. This worthy imagined that a fortune was to be won by the exploitation of Dartmoor. It was at his suggestion that the locality was selected in 1806 as the site of a prison for the army of Frenchmen who had been captured in the wars. Later it was used for Americans taken during the war 1812-14.

Over the main gateway is the inscription “*Parce Subjectis*” (“Spare the vanquished”).

Princetown is 1,400 feet above sea level and claims to be the highest township in England. This being so, the little post office and exchange can also claim this distinction. There is a well fitted post office and the exchange is of the C.B.S. type. There is no recorded fact of a convict having entirely made good his escape from Dartmoor Prison.

“The worth of a thing is best known by the want of it—“street kiosks.”

Some Western District Traffic Maxims.—The service of quality lasts long after the price is forgotten.

Intelligent organisation is a harmonising influence in any business.

Wise men learn by others' mistakes, fools by their own.

Efficiency means accomplishing more with less exertion and less expense.

F. J. F.



[Photo by Edward Oliver, Newcastle-on-Tyne.]

"FINAL" SOCIAL GATHERING AND DANCE, NEWCASTLE.

NEWCASTLE-ON-TYNE NOTES.

Official Visit of Civic Party and Representatives of Chamber of Commerce and Public Utility Undertakings to Newcastle Central Automatic Exchange.

THE preservation of good relationships between the Post Office and the general public in the Tyneside area could not fail to receive a substantial impetus by the official visit of the Lord Mayor of Newcastle and party to the new Central Automatic Exchange, Newcastle, on the afternoon of Thursday, Feb. 5, 1931. The Postmaster-Surveyor, Supt. Engineer, Northern District, and District Manager, with their respective staffs, co-operated to give to a most important assembly of gentlemen drawn from the area an indelible impression of the spirit of service of the Department as evidenced in the transfer to automatic working of the Newcastle Telephone System.

The guests comprised the Lord Mayor of Newcastle-on-Tyne (Alderman David Adams) and Lady Mayoress, the Sheriff (Dr. Leech), members of the City Council, the Mayors of Gateshead, Wallsend, and Jarrow, the Chairman of adjacent Councils, the Chairman of the Postal Sub-Committee of the Chamber of Commerce (Mr. Charles Irwin), Lord Kirkley, Sir Arthur Lambert, Mr. Herbert Shaw (Secretary of the Chamber of Commerce), Mr. B. S. Byng (Managing Director of Standard Telephones & Cables Ltd.), and many other prominent gentlemen.

The party assembled in the dining room of Telephone House, and was accorded a welcome by the Postmaster-Surveyor (Mr. F. Ferguson), who remarked that the transfer which had taken place at midnight on Jan. 31, under adverse circumstances in point of weather, had proved to be wholly successful, and had provided a service which was working very smoothly. The District Manager (Mr. J. D. W. Stewart) said that the installation just opened had put the Newcastle area in the forefront, as regards telephone advancement, not only of this country but of the world. He would, however, like to mark the passing of the old system by an expression of his appreciation of the work of the women of the Department who had operated the manual system for a long period in circumstances which called for qualities of patience and tolerance. The Superintending Engineer (Mr. F. G. C. Baldwin) welcomed the guests on behalf of the Engineering Department, and referred to the development of telephone switching devices culminating in the system installed in Newcastle which represented the product of the best brains available practically throughout the world. He remarked that the Newcastle transfer had raised the percentage of telephone exchange lines worked on an automatic basis in this district from 17.7 to 50, and compared the latter figure to the national figure, which, in November last, stood at 37. He gave a brief description of the improvements effected by automatic apparatus and referred to the fact that the actual transfer of the Central Exchange and its eleven satellites had been completed in 8 minutes. He paid a tribute to the work of the Standard Telephones & Cables Ltd. and drew pride from the fact that the complicated network of underground cabling plant had been designed and installed by the staff of the Northern Engineering District.

The party then divided itself into twelve groups under the direction of an equal number of members of the P.O. Engineering staff as guides, and commencing from several points, the groups simultaneously and without confusion made a tour of the exchange. Each point from the Power Room to the Automatic Manual Switch Room, where Traffic Officers took charge, was explained to the visitors, and from the interest displayed and the questions asked, it was evident that they were considerably intrigued by the intricate apparatus and appreciative of the importance of the function of each part of the installation.

The party again assembled in the dining room to have tea, in the course of which Mr. L. Simon, Director of Telegraphs and Telephones, speaking from the Secretary's Office, London, gave a message, amplified by two loud-speakers, to the Lord Mayor. Mr. Simon said: "It gives me much pleasure to have this opportunity of sending a word of greeting and good wishes to the municipal heads and prominent citizens of Newcastle and the neighbouring towns. Yours is among the earliest of our big industrial areas to change from the manual to the automatic telephone system, which represents the latest stage of technical development in the field of telephony. I may be permitted to express the hope that the new system will commend itself to the subscribers, present and future, and that the telephone will continue to play a part of ever-increasing usefulness in the manifold business and social life of your great community."



[Photo by Edward Oliver, Newcastle-on-Tyne.]

CIVIC VISIT TO NEWCASTLE AUTOMATIC EXCHANGE.

The Lord Mayor, in reply, paid a tribute to the efficiency of the Post Office engineers, and expressed his satisfaction at the installation of the automatic system in the "Metropolis of the North." He asked the Director to convey a message from Tyneside to his (the Lord Mayor's) friend, the Postmaster-General, in which the hope was expressed that a reduction of telephone rates would result from the introduction of more efficient and economical apparatus. Mr. Simon replied that he was pleased to hear the expression of appreciation, but could not be expected at that moment to give any opinion regarding the suggested reduction of telephone rates. He would, however, convey the message to the Postmaster-General.

The Lord Mayor then addressed the visitors and expressed appreciation of the efforts of the Department in the dispersal of the operators rendered surplus by the change-over. He congratulated all concerned in the installation

and expressed his pleasure at the opportunity afforded that afternoon of viewing the working of the new system.

The Sheriff, following, described the exchange as "a veritable wonder house," and expressed his thanks at being allowed to accompany the Lord Mayor on the visit.

The Chairman of the Postal Sub-Committee of the Chamber of Commerce (Mr. Charles Irwin) alluding to the fact that the exchange building had been erected on the site of the old Newcastle Gaol, said that the presence of the Sheriff on such an occasion, in contrast to the occasions on which Sheriffs had formerly visited the site, evidenced the progress of the age. He referred to the facilities provided to Tyneside business men by the telephone system in being able rapidly to communicate with the merchants of the world, and spoke of the cordiality of the relations between the Chamber of Commerce and the Post Office officials of the district. A proposal by Mr. Irwin of a vote of thanks to the local Post Office authorities for their hospitality was carried with acclamation.

Mr. Ferguson concluded the proceedings by expressing the thanks of the local officials for the attendance of the visitors. F. J.

Social.

In spite of the stir and bustle caused by the pending introduction of the automatic system to Tyneside on Jan. 31, the District Manager's staff found time to put their cares and troubles to one side on the evening of Jan. 23, when a dance was held in the Heaton Assembly Rooms. The gathering was in the nature of a farewell to many of our operating colleagues who have since left us to take up duty in towns as far remote as Aberdeen in the North and Bournemouth in the South.

Over 300 members of the staff, including the District Manager, Mr. J. D. W. Stewart, and Mrs. Stewart, with their friends were present, and it was voted by all to have been one of the most enjoyable functions yet organised by the Social Committee.

In the early hours of the morning all joined hands to sing "Auld Lang Syne." To our colleagues who have departed we would say au revoir and wish them good luck in their new offices.

BRIGHTON NOTES.

Contract Officers' Dinner.

THE Contract Officers of the Brighton District assembled at "Booth's Restaurant," Brighton, on Tuesday, Feb. 3, on the occasion of their first Dinner, the company numbering over 40. The function was most opportune, for amongst the guests of the evening were Mr. G. Edward, the newly appointed D.M. for the district, whilst others present in this capacity included Mr. E. Brown (Contract Manager), Mr. J. A. W. Gregory (Traffic Supt. II), with Messrs. Hine, Batts, and Wells, of the Contract Clerical Staff.

Mr. P. A. J. Barker (Class I) presided, and the musical items were rendered by the following members of the Contract Staff: Messrs. Ansell, Tice, Batts, Back, Leutchford, Murphy, and Young. A capital programme was provided, which was greatly appreciated by the company. Community singing, which proved to be most popular, played a prominent part in the evening's entertainment.

Mr. McVitty as "Toastmaster" was a distinct success.

Following the "Loyal Toast," Mr. Cook (C.O.I), Vice-Chairman, in proposing the toast of "The Guests," made an admirable speech and caused much enjoyment by introducing the names of various officers present in a most subtle manner. Mr. Edward, the new District Manager, in a warm speech expressed his pleasure and appreciation of the opportunity of being present, and thanked the staff for his welcome to Brighton. He applauded the spirit of intercourse which such gatherings promoted, and trusted that similar functions would be held with benefit to all.

Mr. Brown, Contract Manager, whose kindly personality met with warm applause, expressed his pleasure at having the opportunity of being in the bosom of his "family."

Mr. Gregory responded for the Traffic Dept, and Mr. Hine for the Clerical Officers.

Mr. Batts followed with the toast "The Contract Officers," and in reply, suitable response was made by Mr. P. A. J. Barker, and Mr. Bright-Smith (Chichester).

Mr. Back (East Grinstead), in giving "The Committee," thanked them for their efforts in arranging such an excellent evening's enjoyment.

Mr. Matthews, responding, in a most enthusiastic and able speech, referred to the *esprit de corps* existing amongst the staff, and the benefit to all of social intercourse on such gatherings as this, which all made for co-operation, efficiency, and smooth running of our work. The good work started that evening should continue and a permanent committee be formed to organise social functions of a like nature. In conclusion he spoke of the untiring efforts of the Hon. Secretary (Mr. James). With such an energetic official there should be no limit to its possibilities.

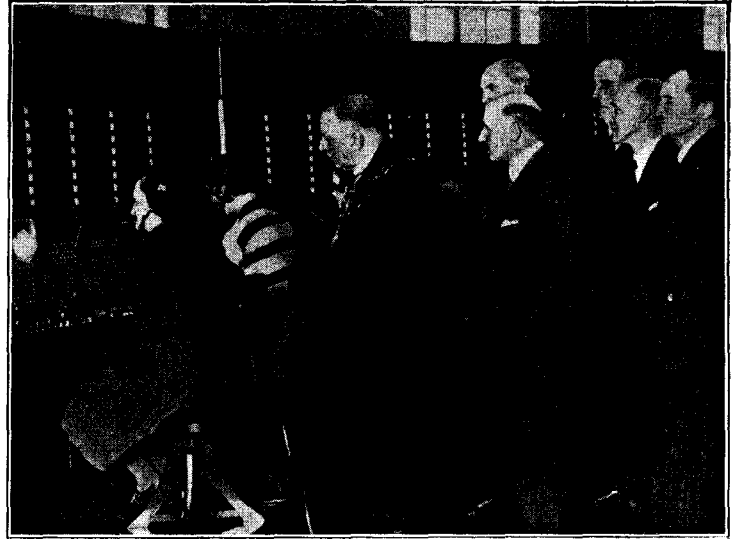
Mr. Constantine (Worthing), in an appreciative speech, paid tribute to Mr. P. A. J. Barker, the Chairman, who suitably responded.

The toast, "The Artists," proposed by Mr. Matthews, was replied to by Mr. Ansell in an appreciative vein.

An altogether memorable and enjoyable evening was concluded by the singing of "Auld Lang Syne."

MORECAMBE WHIST DRIVE AND DANCE.

IN connexion with the opening of the Morecambe Telephone Exchange, a whist drive and dance was held in the Ambulance Hall on Jan. 19. Upwards of 120 people were present. The guests of the evening were Mr. R. Bell, surveyor, North-Western District, Preston, Mr. J. K. Murray, District Manager, Preston, Mr. J. M. Shackleton, Superintending Engineer, Preston, Mr. J. Leith and Mr. R. Morgan, District Office, Preston, and Mr. H. Wood, Postmaster of Lancaster and Morecambe.



[Photo by G. Blackburn, Lancaster.]

MORECAMBE TELEPHONE EXCHANGE.

The prizes for whist were won by: Ladies—Mrs. Wood, Mrs. Green, Mrs. Mason, Miss Bate; Gentlemen—Mr. Goodwin, Miss Lyon, Mr. Hodgkinson, and Mr. Murray, which were presented by Mr. R. Bell. Mr. W. Cox acted as M.C. The dancing was under the supervision of Mr. F. C. Lupton, spot prizes being presented by Mrs. H. Wood.

The "Revellers" Band from Preston, under the direction of Mr. James Hartley, introduced several interesting numbers, which were greatly appreciated. The arrangements were carried out by Mr. J. E. Lupton.



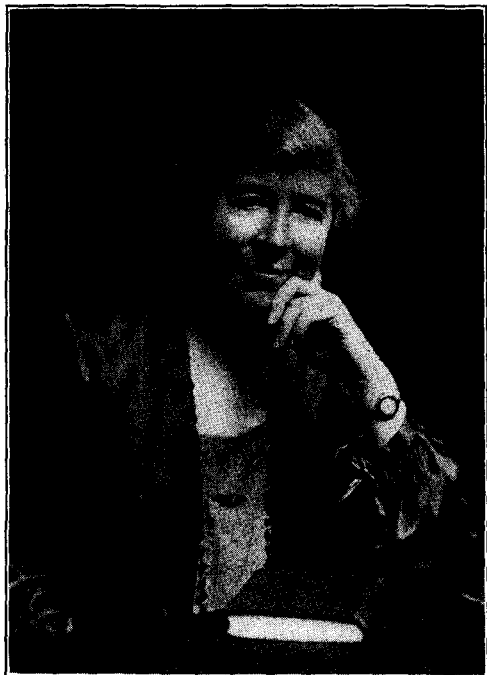
[Photo by G. Blackburn, Lancaster.]

MORECAMBE G.P.O.

RETIREMENT OF MISS LIDDIARD.

By the retirement of Miss J. LIDDIARD, M.B.E., Superintendent in the Controller's Office, London Telephone Service, the Department loses with regret not only a valuable officer but a gracious and popular presence.

Previous to her appointment in the London Telephone Service in 1904 Miss Liddiard had had a very varied experience in the Savings Bank Department covering a period of 13 years. This



MISS J. LIDDIARD, M.B.E.

early training under the excellent disciplinary methods of that branch of the Post Office proved particularly helpful in fitting her for the work in connexion with the building up of the new Post Office London Telephone Department, which only came into being in 1902.

The work she was called upon to undertake in her new position was exacting, arduous, and needed much tact and initiative. It entailed organisation and responsibility in connexion with every phase of the headquarters work. Staff work, directory matters and the very complicated Accounts Section all came within her province. There was practically no question of policy in the ever changing development of this important department in which she did not take a prominent share.

Doubtless owing to her well-deserved reputation, Miss Liddiard was called upon during the war to assist in organising the work of pensioning disabled soldiers at Chelsea under the newly-constituted Ministry of Pensions. She trained a large staff of women who were in those days mostly recruited from temporary and unskilled labour. For her achievement in this connexion she received the honour of M.B.E.

It may be that power to control and manage one's fellow beings is largely a matter of individual equipment, for which quality Miss Liddiard was no doubt chosen. But in addition she has a just sense of values and a pleasing manner, which attributes have always kept a personal touch between herself and her ever-growing staff. Though never losing sight of the necessity for maintaining strict discipline and the prestige of the Department she never failed to consider sympathetically the offender's or applicant's point of view and to make every concession possible according to the circumstances.

Her unpublished acts of generosity to those of her staff who needed private help she may not wish recorded; but as a farewell tribute it must be acknowledged that all appeals to her met with a ready response.

Perhaps the youngest and largest portion of the women now under her control do not fully realise how much they owe to Miss Liddiard and other women pioneers of her generation. She entered the field when women's work in the Civil Service and business world was hardly recognised, a period more than 20 years before women obtained the vote. The handicaps and prejudices barring women's progress in the professions during the eighteen nineties and King Edward's reign might well have turned less patient and strong-minded people than Miss Liddiard and her fellow-workers back to the domestic hearth in despair.

Finally, it must be mentioned that strenuous as have been her official duties, Miss Liddiard has not made the error of allowing utter absorption in these to narrow her outlook on life. She has always found time for much activity in musical matters and is well known for her accomplishments as a violinist. Her sympathy and assistance have never been refused for any social endeavours amongst her staff. Special attention must be drawn to her interest in the swimming and netball clubs and her generosity in the provision of prizes.

She leaves with the best wishes of her staff that her well-earned retirement may be long and enjoyable, and if she uses her experience and abilities to take up any other work may it be as lastingly successful as her life's work in the London Telephone Service.

R. A. R.

LONDON ENGINEERING DISTRICT NOTES.

POLLARDS Automatic Exchange was brought into service on Wednesday, Feb. 4, at 1.30 p.m., replacing the C.B. 10 relief exchange in the same building at Norbury. The Auto Exchange, manufactured by Messrs. Siemens Bros. & Co., Ltd., has an initial capacity of 4,000 lines with an ultimate capacity of 10,000. 1,736 subscribers, with 269 junctions and order wires were successfully transferred. The Manual Exchange is now being recovered.

The rapid expansion of the Automatic Exchange System in London involves among other things considerable rearrangement of the telephone areas, and in consequence a large number of transfers from one exchange to another are necessary. On Jan. 31, an extensive programme of area correction transfers was carried out, the most important being as follows:—

- (1) The opening of Whitehall Hypothetical Exchange on Gerrard, by the transfer of lines from Gerrard and Regent Exchanges. This is one of the preliminary operations associated with the provision of the Whitehall Auto Exchange and the conversion of Gerrard and Regent Exchanges to automatic working.
- (2) Transfers from Gerrard Exchange to Regent Exchange, and vice versa, to enable the numbering schemes for the future automatic units to be prepared.
- (3) The establishment of a Leytonstone Hypothetical Exchange on Walthamstow by the transfer of certain Walthamstow subscribers to the former exchange.
- (4) The closing down of Kelvin Exchange by transferring the final batch of Kelvin subscribers to the Western Automatic Exchange. In order to effect this change arrangements were made for all calls for Kelvin originating at automatic exchanges to be routed to the proper auto manual board. This entailed modification of the director translation for Kelvin on all directors on that level. 50% of the directors were altered one by one up to 1.30 p.m. on the date of the transfer, and busied out. At 1.30 p.m. the altered directors were brought into service, and the remaining 50% busied. These were modified subsequently and brought into use again. Test calls were made to prove that the correct modifications had been made to the directors.

Approximately 6,700 transfers were carried out in various exchange areas on Jan. 31.

It is interesting to note that in the West Internal Section 50% of the total exchange and subscribers' plant is now automatic.

A Record.

The number of men employed in the Central Internal Section now exceeds 1,000.

A New Fire Alarm System for London.

A Gamewell Fire Alarm System is being installed by the Standard Cables and Telephone Company for the L.C.C. in the Southwark Area. Whitefriars Fire Brigade Station is being equipped as a Superintendent's Station, and Southwark Fire Brigade Station as an Out Station. From the latter there will be two loop circuits comprising 28 call points. The two stations will be connected by junction circuits, and the operation of a call point will transmit the code of the particular call point to both Stations. The signals will be received audibly on gongs and permanently on a tape which will also be dated and timed. As is generally known, in the Gamewell System a permanent current of 100 m.a. is maintained on the call point circuits, the signals from the points being produced by mechanism which interrupts the permanent current a definite number of times corresponding to the number chosen as the code of the point. The circuits are therefore under constant test and the arrangements at the controlling station are such that faults on the system are at once revealed. It is possible for the system to continue working with a disconnection in the line circuit, and a single earth fault will not put it out of action, while it is proof against accidental false alarms. The working of the present installation will be watched with interest as upon its success or otherwise will depend the decision of the L.C.C. to adopt a similar system throughout London.

Damage to Poles.

During the past few months poles in which holes have been made by woodpeckers, have been renewed on a trunk route along the Grand Junction Canal, near Brentford. Some of the poles were quite near to the Great West Road, where the road traffic practically never ceases. Mentioning the Great West Road, it is interesting to note the number of large factories which are springing up along this arterial road. In many of these telephone installations of considerable magnitude have been provided. Similar conditions appear to be developing along Western Avenue arterial road, which runs North of Acton and Ealing.

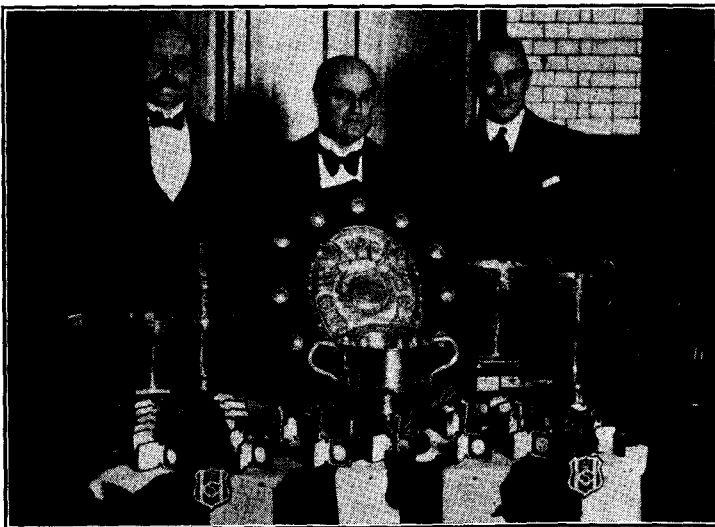
Out of Sight.

In connection with the presentation of the Imperial Service Medal to an underground lineman recently, one of the recipient's colleagues said that the medal had been well earned as the lineman had spent so many years working in manholes. Of course, there are manholes and manholes. Some have plenty of room, but many more are cramped for space. Some are comparatively dry, while others are always very damp. In some the air seems quite pure, but in others much care has to be taken to avoid the accumulation of foul air. There is some wonderful work performed underground by many of the Department's workmen, and perhaps being out of sight they do not always receive the credit due to them.

Well Done.

An overhead foreman retired on the age limit at an exchange in the Western suburbs of London a few weeks ago, and a farewell ceremony was organised by his fellow workmen. In his little speech our retiring friend was not able to say how many poles he had put up or how many miles of open wires he had erected during the course of his official career. He has been a quiet conscientious worker, a man of deeds rather than words. Some do not see the fruit of their labours, but this man, at any rate, can, if he wishes walk round and inspect what he was instrumental in putting up in days gone by.

P.O. Eng. Dept. (L.E.D.) Swimming Club.—Presentation of Trophies by E. Gomersall, Esq., O.B.E., M.I.E.E., at Lavington Street Baths, Jan. 30, 1931.



[Photo by R. G. Nichols, Fulham.]

T. H. Edgerton, Esq. E. Gomersall, Esq., A. W. Kelly, Esq.
Vice-President. President. Hon. Secretary.

Enrolments for the coming season are now being made. Intending members of both sexes, will be welcomed, and should apply to the Hon. Secretary, Mr. A. W. Kelly, as soon as possible.

Football.

Football.—Civil Service (Lewis) Cup, 3rd Round (Replay).—P.O. Engineers (L.E.D.) reach the Semi-Final.

The Engineers beat the Ministry of Pensions in the Third Round (Replay) on Thursday, Jan. 22, at Chiswick, by four goals to three, before about 200 spectators. It was an excellent and clean game, contested with the usual spirit which is always evident when these two teams meet. The L.E.D. meet Birmingham in the Semi-Final. The match will be played on Feb. 25, after these notes have gone to press. We hope to give a report of the match in the next issue.

L.E.D. Team.—Donegan; Finall, Webdale; Bateman, Toleman, Hopkins; MacMillan, Kinch, Pulling, Codling and Merrick.

LIVERPOOL NOTES.

THE month elapsed since the writing of the last notes has been a period of little incident, the calm after the Christmas and New Year storms of revelry and entertainment. There is, therefore, not much of general interest to record but it may be mentioned that the local notes have stimulated interest in the Journal and we hope as a result its circulation will be increased.

It was brought to notice by a member of the operating staff that a blind subscriber occasionally asked for other subscribers by name, being alone at the time and unable to read the Directory. The regular operators knowing of his infirmity did not insist on the number but others not familiar with the



MISS FLORENCE LEWIS.

circumstances very properly requested the caller to give the number. The staff of the Exchange as a whole took a very sympathetic view of the case and it was suggested that some special arrangement might be made to assist the subscriber. This has been done. The incident is indicative of the truly sympathetic attitude of the staff to the afflicted and of the spirit of service with which the operating staff is imbued.

In the January notes, we referred to the promotion of Mr. A. W. G. Hewitt, and his transfer to Reading. Mr. Hewitt actually departed from the Liverpool District on the 31st of January. Before leaving he was presented with a case of cutlery by his colleagues to mark his promotion and their sincere regard for his many estimable qualities.

After the usual periods of probation three members of the Liverpool District Office staff have obtained preferment to the Departmental Clerks Class at the Ministry of Labour. The Misses A. E. Allen, A. Harrison and M. E. Clark, appointed respectively to Wigan, Warrington and Preston. Each received gifts from their official friends on severing their connection with the Post Office.

Miss Florence Lewis, who is a member of the Trunk Exchange operating staff, took a leading part in a recent presentation by amateurs, of the Operetta, "The Arcadians" at the Crane Hall. Miss Lewis possesses a voice of excellent quality and range and recently delighted her many friends at a concert given in honour of our recently retired Postmaster-Surveyor.

THE CALCULAGRAPH.

By J. R. SUTCLIFFE, LEEDS.

How does the timing machine work? This question was propounded by one of a party of schoolboys visiting Leeds Trunk Exchange to a traffic officer acting as conductor.

It was explained that the right-hand impression indicated the time of day the call was made, the middle one the duration of the call to the nearest five minutes, and the left-hand one the duration to the nearest quarter minute.

The boy appeared very interested, but after a moment's thought said, "Yes, but how does the arrow move to just the right position?" The official evasively but with conviction replied: "It is driven by clockwork." The tone apparently stopped further verbal questions by the schoolboy, but not mental ones by the official. "Dash it all," thought the guide, "how does the thing work? I used to know the principle, but I could not possibly explain it now. If the arrow moves round as does the hand of a clock it should be almost in the same position on each of two calls which are timed off in succession, although one may have been on for four, and the other for two minutes respectively."

The new system of payment for trunk calls comparable with the payment for the use of taxicabs has increased considerably the importance of calculagraph impressions. It is thought, therefore, that a brief explanation of this timing device and methods may be of interest, particularly to our friends in Accounts Sections who handle many thousands of tickets bearing the dial impressions.

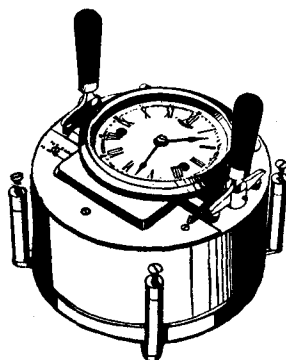


FIG. 1.

Fig. 1 is a picture of the calculagraph machine. The ticket to be timed is inserted, face downwards, beneath the plate in front of the clock dial. By pushing back the right-hand lever the stamps which impress the time of day are operated. Then by pulling forward the same lever, the centre and left-hand blank dials are printed.

When the ticket is to be timed off it is again inserted face downwards. The left-hand lever is then pulled forward, and this

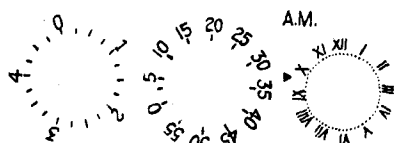


FIG. 2.

THE ORIGINAL IMPRESSIONS SHOWING THE TIME AND TWO BLANK DIALS AFTER THE TWO MOVEMENTS OF THE RIGHT-HAND LEVER.

causes the two arrows to be printed in the centre and left-hand dials indicating the duration of the call.

Let us consider the left-hand impression of Fig. 3 which is capable of indicating the duration of a call to a quarter-minute. Both the dial and arrow stamps are in constant motion, being driven round at a uniform speed of one revolution in five minutes. (It is in this that the important basic principle of the machine is

contained. It is generally thought that either the dial or arrow moves and that the other is stationary.) Thus, if both dial and arrow stamps are operated at the same time, the arrow is shown

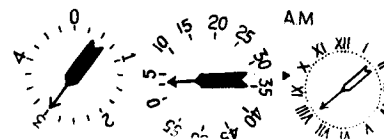


FIG. 3.

THE FULL IMPRESSIONS SHOWING A DURATION OF THREE MINUTES.

at zero position on the dial. If the arrow stamp is operated a minute after the dial stamp it will have moved round to a position indicative of this duration on the previously stamped dial.

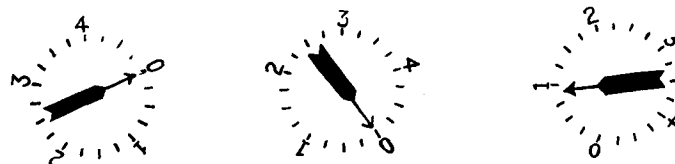


FIG. 4.

THE QUARTER-MINUTE DIAL. BOTH STAMPS OPERATED AT ONCE.

THE SAME CONDITIONS A MINUTE LATER.

HERE THE ARROW STAMP WAS OPERATED A MINUTE AFTER THE DIAL STAMP.

In conclusion, it should be mentioned that the calculagraph stamp is of considerable psychological value as proof of the duration of a call when it is in dispute with a subscriber. The machine stamp carries greater weight in the discussion than any manuscript timing can do.

TELEGRAPH AND WIRELESS BRANCHES DINNER (SECRETARY'S OFFICE).

THE first annual dinner of these branches was held at the Florence Restaurant, Rupert Street, on Feb. 12. Mr. F. W. Phillips, Assistant Secretary, presided over a representative gathering of the staffs of the two branches, and members of other sections, amongst whom were Mr. Napier, Controller of the London Telephone Service, and Mr. H. S. Pearce, of the Solicitor's Office. The dinner was of an informal and jovial character, and a most enjoyable evening was spent.

The speeches were few, to the point and meritoriously brief. Mr. H. S. Pearce, of the Solicitor's Department, in proposing "The Telegraph and Wireless Services," tried by some special pleading to credit lawyers with foreseeing the advent of wireless. Mr. G. Bowthorpe, one of the respondents, claimed that poets and artists were your only true prophets, and felicitously instanced Goethe, but made us uncomfortable by informing us that wireless was neither a science nor an art, but a nondescript. Mr. F. G. Birkett enlarged upon the blessings and benefits of wire telegraphy, and Mr. J. McIntyre responded for the Overseas section.

Col. Crawley's eulogistic remarks on the Chairman when proposing his health met with the warmest response from all his listeners. Mr. Phillips, in replying, referred to the wireless services as healthy and promising babes, deplored with paternal sorrow the loss of one of the most robust, and showed anxious solicitude for that delicate infant, picture transmission.

The committee had arranged a varied programme, Messrs. W. H. Smith and W. J. Beale (baritones), Mr. W. E. Keates (tenor), Mr. G. W. G. Monsear (conjurer) and Mr. H. A. Sainsbury (humorous) providing excellent entertainment. The accompanist was Mr. H. M. Wilson.

The committee, Messrs. E. H. Hamlet, A. G. Hill, and B. E. James, deserved, and received, the hearty thanks of all present.

W. H. G.

GLASGOW TELEPHONE NOTES.

On Jan. 23, 1931, the Traffic Staff met to bid goodbye to Mr. E. E. Wilkins, Assistant Traffic Superintendent, on the occasion of his transfer to the Headquarters' Traffic Section in the Secretary's Office, London. In presenting a number of volumes to Mr. Wilkins, in token of the esteem in which he was held, Mr. Coombs, District Manager, conveyed to him the best wishes of the staff for his success in the years to come, aptly and humorously introducing an aside to indicate one particular direction in which Mr. Wilkins' future could be very happily influenced. Mr. Johnson, Traffic Superintendent, also spoke in appreciative terms of Mr. Wilkins' service in the Glasgow Office.

Mr. Wilkins' connection with the Central Exchange, as Exchange Superintendent, was recognised by the Staff there and, to indicate their appreciation of his worth, they presented him with a gold wristlet watch and gold cuff links. At the Civil Service Sports Ground, Scotstoun, on an earlier date, he received a gold Eversharp pencil with the good wishes of the Civil Service Hockey Club, of which he was Vice-President, and a gold Cigarette Case was the gift of his Football Colleagues.

The many friends of Miss A. Booth, Telephonist, Central Exchange, will regret to hear of her retirement on account of ill-health. Her former colleagues took the opportunity of sending her a token of esteem with an expression of their wishes that she might soon be restored to health.

The Night Telephone Staff met in the Bath Hotel on Feb. 7, to do honour to Mr. John W. McDougall, Supervisor, Central Exchange, on the occasion of his retiral from the Service. Mr. Feeley presided and in the course of his remarks referred to the high esteem in which Mr. McDougall was held by all. He added that he had been deputed by the District Manager and the Traffic Superintendent to convey to him their good wishes for many years of health and happiness.

Mr. John Coyne, of the U.P.W. Executive, in asking Mr. McDougall to accept a gold watch, made fitting reference to his 33 years' telephone service with the National Telephone Company, the Glasgow Corporation Telephones and the Post Office, and paid tribute to him as officer and friend. Mr. McDougall, who was visibly touched by the interest shewn in his well being, returned his most grateful thanks. During the evening a concert, sustained by artists from the Night Staff, was thoroughly enjoyed.

Glasgow Post Office War Hospitals Entertainments Committee.

The seventh entertainment of this winter's series was given at Ralston Hospital on Jan. 16. Mr. Law, Chief Clerk, Telephones, presided. The entertainment was arranged by the staff of the Govan and Ibrox Telephone Exchanges and the Head Office Typist staff. Whist was the order of the evening and play is always keen at Ralston. While the checking of the scoring cards was proceeding Mr. A. H. Allan, Inspector, delighted his audience with his singing of "McGregor's Gathering" and "Moire, My Girl." Miss Muir, Supervisor, Govan Exchange, presented the prizes for whist. Dr. Vickers, the genial Medical Superintendent, thanked the company for providing such a splendid evening which closed with Auld Lang Syne. The Hospital staff are ever mindful of the needs of the inner man or woman and the "cup that cheers" fulfilled its description. The company left Ralston Hospital feeling that they were not quite certain whether they had entertained or had themselves been entertained, but in any case the result had proved particularly satisfactory to all concerned.

The Central Exchange Telephonists Dance was held in the Prince of Wales' Halls on Jan. 23, and proved as usual a well attended and most enjoyable function. Amongst a representative gathering were Mr. and Mrs. Coombs, Mr. and Mrs. Johnson, Mr. Lucas, Miss Kay and Miss Cameron.

The Western Exchange Staff Dance held in the Prince of Wales' Halls on Feb. 4, proved a great success judging from the high spirits and unrestrained merriment of the company. Miss Houston deputised for Miss Fleming, who was regrettably unable to be present owing to illness, and presented the prizes to Misses I. Kerr, and L. Montgomery, and partners, winners of the Spot Light dances.

A telegram received from Mr. E. Wilkins from London, wishing the dance every success, was greatly appreciated by the Western Staff. The Committee hope to have the pleasure of meeting the same cheerful company at their dances in the future.

Marriage.—Miss A. Fergus, Douglas.

C.T.O. NOTES.

Promotions.—Miss J. E. M. Nash, Supervisor to Supervisor (Higher Grade); Miss M. A. Aitken, Assistant Supervisor to Supervisor; Mr. E. G. Ogilvie, Telegraphist to Overseer.

Retirements.—Messrs. W. T. Holt, Clerical Officer; G. Angus, Overseer; A. Sayers, A. E. Peirce, C. E. J. Ford, W. Teear, Telegraphists; Miss H. M. Riminton, Supervisor (Higher Grade); Miss M. T. M. Mason, Telephonist.

Obituary.—We regret to record the death of Mr. L. Weaver, in his 84th year. His passing recalls the early status of the staff of the Controller's Office of other days, under the Controllorship of the late Sir H. C. Fischer. At those times and for many years the Controller's staff was of a reclusive character, aloof from the Instrument Galleries. In 1894, it was made a separate establishment, and Mr. Weaver had as his contemporaries Messrs. R. Boxall, J. R. Jelf and R. Headland. Mr. Weaver was of a quiet, retiring disposition and retired on pension in 1907.

Annual Dinners.—The "F" Division held its Annual Dinner at the Old Bell Restaurant, Holborn, and eighty-nine past and present members attended. A very enjoyable evening was spent and the musical programme proved to be well balanced.

The Special Section ("C" Division) foregathered at the London Tavern for its Annual Dinner where a good gathering of past and present members had a happy evening.

The C.T.O. Veterans Annual Dinner will take place at Anderton's Hotel, Fleet Street, on Friday, March 13, at 6 p.m. The tickets are 5s., and may be obtained from either Mr. A. Dixon, 155, Jerningham Road, S.E.14, or Mr. C. O. Viveash, 7, Ellaline Road, Hammersmith, W.6.

Reunion of Retired C.T.O. Supervision.—Possibly the largest gathering of old Civil Servants now on the Retired List of Supervising Officials, late of the C.T.O. and its kindred branches, took place of Wednesday, Jan 14, in the commodious Tea Salon of the Express Dairy Company's Depot, Hart Street, Bloomsbury, when no less a record number of 113 assembled for their 11th New Year Reunion.

Mr. J. Bailey, I.S.O., a late Deputy Controller of TS, was in the Chair, and he had for his immediate supporters Messrs. B. G. Askew, E. Lewis, A. W. Ward, A. W. Edwards, O.B.E., another late Deputy Controller of TS, and others, and it may be said that the three first-named vied with each other for the so-called "Doyenage," of all those present. A well-served and splendid tea was provided for the occasion. At the commencement of the proceedings, the Chairman announced that their oldest ex-colleague, Mr. W. S. Fisher, had been prevented by his Doctor from going out of doors, owing to a bronchial attack. This was the first occasion since the institution of these gatherings, 11 years ago, that Mr. Fisher was compelled to be absent, and a telegram of sincere regret and hopes for a speedy recovery was sent to him.

Mr. C. S. Keen, submitted a very long list of greetings and regrets from those unable to be present, due principally to distance and ill-health.

Sport.—*Football.*—The "Centels" Football Club Tour this year was to Eastbourne and Worthing and both matches were won.

C.T.O. Operatic and Dramatic Club.—"Miss Hook of Holland."—An illustrated report of this performance is unavoidably held over until next month.

Dramatic Section.—"A Damsel in Distress," a comedy, by Ian Hay and P. G. Wodehouse, will be presented at the Cripplegate Theatre, on March 18 and 19. Tickets 3s. 6d., 3s., and 1s. 10d., can be obtained from Mr. J. Henry, Ticket Secretary, C.T.O., E.C. 1.

SHEFFIELD.

To the few remaining members of the old Special Staff of "Toots" Tommy Mason and Tony Walkers' days, the following news-cutting of the passing of another of the old guard who did so much to make the Telegraph Service so efficient, may be of interest:—

Obituary.—We regret to record the passing of Mr. C. R. Morton, who retired through ill-health, nearly twenty years ago, from the position of Telegraph Superintendent. Though of an unassuming nature, he was, in his earlier days, a very skilled telegraphist. In the days when Sheffield provided a good number of telegraphists for the racing staff, he was well known at the various race meetings up and down the country, as an expert in wheatstone working.

For many years he had to put up a strenuous fight against recurring ill-health, accentuated in later years by the loss of his only son, as a result of a disability caused by the war. Messrs. C. Kemp, G. Dixon and Miss R. E. Thompson represented the Telegraph Staff at the funeral on Jan. 3.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

By HARRY G. SELLARS.

(Continued from page 92.)

- 1910, July ... Baudot multiplex telegraph apparatus inaugurated on London-German lines. Double duplex arranged by A. C. Booth.
- J. Pierart, of Brussels, suggested increasing the Hughes output by using a double detent and set of cams, so that the number of revolutions of the printing axle would be doubled. The practical results were unsatisfactory and Pierart eventually devised a means of increasing the speed of the typewheel and chariot.
- Great Northern Telegraph Company's concession for working Anglo-Norwegian cables expired and service was taken over by the British and Norwegian Governments who purchased the old cable and laid another.
- Western Union Telegraph Company and American Telephone and Telegraph Company amalgamated.
- Western Union and Postal Telegraph Companies of America introduced the "night letter" system of telegrams accepted at low rates.
- Anglo-German Telegraph Commission formed to investigate the technical and working conditions of Anglo-German cables.
- A. C. Booth proposed a method of using condensers for reducing induction between the various cores of a cable.
- British Government appointed a committee on Imperial Wireless Telegraphy.
- 1910, Aug. 10 National Telephone Company licensed to provide fire, police and ambulance circuits.
- 1910, Aug. 15 Western Union cable laid between Great Britain and Newfoundland.
- Royal Commission on Trade Relations between Canada and the West Indies (Chairman, Lord Balfour of Burleigh) favoured Government expropriation of West Indian Cables.
- 1910, Sept. 23 Western Union cable laid between Newfoundland and New York.
- 1910, Oct. ... Post Office opened wireless telegraph communication between Sanday and North Ronaldshay.
- Agreement signed by the Postmaster-General and the National Telephone Company for a simultaneous inventory of plant by the Company's staff, and its check by Post Office staff. The work commenced at once.
- Rate for unlimited telephone exchange connexions in London, £17. Message rate, for Inner London, £5 per annum plus 1d. or 2d. for each originated call, for Outer London, £4 per annum plus 1d. or 2d. for each originated call. Minimum payment for calls, 30s. per annum.
- 1910, Nov. 26 ... Writer in *The Times* (London) suggested link with the Pacific Cable via Orkneys, Shetlands, Faroe Islands, Iceland, Greenland and Labrador.
- British Post Office Telephone cable laid from Dover to Calais, with induction coils. British Post Office Telegraph cable laid from Newbiggin to Arendal.
- Pacific cable U.S.A. to Japan, via Honolulu, being considered by Americans.
- French cable laid between Queensland and New Caledonia as first step in the connexion between Australasia and North America.
- Wireless station opened at Cocos by the Eastern Extension Telegraph Company.
- Wireless messages from Clifden were received by a ship at a distance of 6,735 miles.
- Insured Box system extended to Austria, Bulgaria, Denmark, Egypt, Germany, Holland, Italy, Luxembourg, Montenegro, Norway, Portugal, Roumania, Switzerland, and certain post offices in Turkey in Europe.
- Telegraph Money Order service started with Newfoundland and Tunis.
- 1910, Dec. ... 310,000 miles of wire in use for telegraphs in United Kingdom.
- 209,000 miles of trunk telephone wires in use in United Kingdom. Nearly 30,000,000 trunk calls made.
- Under the Treasury minute of 1892, telephoning of telegrams had developed and 5,540,000 telegrams for onward transmission were telephoned to the Post Office during the year.
- Power to issue licences of various kinds transferred to Post Office from time to time so that in this year 36 different kinds of licences were issued.
- Number of parcels exchanged with United States reached 247,370, as compared with 159,850 in 1908.
- Withdrawals from Post Office Savings Bank by telegraph, 135,000.
- 1911, Jan. 1 ... Anglo-American Telegraph Company, Direct United States Cable Company and Western Union Telegraph Company combined.
- 1911, Feb. 17 ... Western Union cable between Great Britain and New York (via Newfoundland) opened for public traffic.
- Western Union Telegraph Company introduced "day letter" telegrams at a tariff one-half more than the "night letter" rate.
- Donald Murray's multiplex printing telegraph put on trial between London and Manchester.
- Telewriter Company licensed to provide communication between subscribers.
- 1911, June 22 ... Post Office placed postcards and letter cards on sale at the face value of the stamps printed thereon.
- 1911, July 21 ... G. A. Campbell and T. Shaw patented a means of "loading" a phantom circuit derived from two "loaded" physical circuits.
- 1911, Aug. ... Baudot installed on London-Lyons telegraph line.
- Messrs. John Lee, J. Stuart Jones, Purves and A. W. Martin visited America on behalf of the Post Office and reported on automatic telephone systems.
- Murray multiplex telegraph working between London and Manchester.
- Dr. L. W. Austin, of U.S. Naval Department, pioneer of long-distance wireless signal measurement, published paper describing quantitative experiments.
- 1911, Sept. ... Dr. Eccles postulated a theory of electrical wave propagation.
- Imperial Conference agreed that a chain of British State-owned wireless stations should be established within the Empire.
- "Deferred" telegrams accepted by certain countries.
- Loaded telephone cable laid between England and Belgium.
- Balata included in the insulating material for the first time.
- R. von Lieben showed that a three-electrode thermionic valve could be used as a relay.
- Charges for foreign telegrams ranged from 2d. to 4s. 7d. a word.
- "Home Safe" system adopted in connexion with the Post Office Savings Bank as a substitute for the slip of postage stamps means of deposit.
- 1911, Oct. ... Baudot multiplex telegraph apparatus inaugurated on London-Italian lines.
- 1911, Nov. 27 ... 1,112,000 words of press dealt with at the Central Telegraph Office in connexion with Sir Edward Grey's speech on the Moroccan crisis.
- 1912, Jan. 1 ... Post Office factories merged into the Stores Department.
- Post Office took over the National Telephone Company's system with 9,000 employees, 1,565 exchanges, 561,738 telephone stations and 1,500,000 miles of wire.
- Murray sold the United States patent rights of his multiplex printing telegraph to the Western Union Telegraph Company.
- 1912, Feb. 5 ... Zone system introduced in Anglo-French telephone service and calls to Paris reduced to 4 shillings for 3 minutes.
- Wireless "direction finding" introduced.
- 1912, March ... A combination of newspapers sent 86,000 election telegrams.
- Another telephone cable laid between England and France.

(To be continued.)

THE Telegraph and Telephone Journal.

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APRIL, 1931.

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, Fleet Street, London, E.C.4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXXV.

MR. FRANCIS G. C. BALDWIN.

MR. FRANCIS G. C. BALDWIN, the subject of our sketch, was born at Sheffield in 1878. Before entering the service of the late National Telephone Company as a draughtsman, in January 1896, he had received a training in science and general engineering at Sheffield Technical School (afterwards the Technological Department of Sheffield University) and been associated with Messrs. Thos. Nash & Sons, Sheffield, for a short time. Whilst engineer for the National Company in Sheffield, he completed the metallic circuiting of subscribers' lines in that town, and planned and superintended large extensions of the underground system in the district. In October 1906 he was appointed District Manager for Birmingham. During his period of office he reorganised the whole of the existing underground system in Birmingham and prepared schemes for conversion from magneto to common battery working on a large scale. In 1909 he was appointed Assistant Metropolitan Engineer, and on the transfer of the Company's



[Photo by James Bacon & Sons, Newcastle.]

system to the State on Jan. 1, 1912, he became Sectional Engineer of the City External Section of the London P.O. Engineering District. Mr. Baldwin became Assistant Superintending Engineer of the Northern District in 1913, and Superintending Engineer of that district in the August of last year. The conversion of the Newcastle-on-Tyne system to automatic working, during his period of office in this district, is fresh in the minds of our readers.

Mr. Baldwin received the Fahie premium for his paper read before the Institution of Electrical Engineers, on Jan. 24, 1918, on the subject of "Telephone Exchange Transfers and their Organisation." He is well known as the author of a standard "History of the Telephone in the United Kingdom," published in 1918. He is a member of the Institution of Electrical Engineers.

Mr. Baldwin finds his recreation in gardening and carpentry, and his knowledge of colour photography is extensive, although his practice has diminished in recent years. He is a great organiser, in which direction his wide knowledge of everything pertaining to telephones stands him in good stead.

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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		W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

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THE STATISTICAL "AS YOU LIKE IT."

COMPARATIVE telephone statistics have been based on different data at different times. In the earliest days the number of subscribers was the usual criterion of telephone development, but this soon gave place to the number of telephones, or "stations" (*postes d'abonnés* as the international statistics have it), although some few governments still furnish their data in terms of subscribers' lines. Returns were presented to the House of Commons earlier in the century of the "miles of telephonic wire" in the principal countries of Europe, and many consular reports and official documents still favour this form of statistic. Countries again in which "flat rates" are still in widespread use are fond of pointing with pride to the number of calls made *per capita* per year. Another form of comparison which can be made is one which takes into consideration mere numbers, and place countries in an order of merit based on the total number of telephones they possess, as for instance, the United States first with over 20 million; Germany second with over 3 million; Great Britain third with over 2 million; Canada, France, and Japan next with over one million, and so on. Then, again, there are those who pay no attention to the smallness of a State's telephone system, but, pointing to percentages only, hold up Iceland, Luxemburg, and the Free City of Danzig to the admiration of an astonished world.

Another statistical feature which engages attention is the percentage rate of increase per annum. Some countries, including

the most highly developed, increase only at the rate of 4 to 5%, or even 2% or less; some countries increase at rates varying between 4 and 7%; whilst others, and especially the poorly developed countries, may increase in any one year at anything from 10 to 25%.

There are manifest advantages to the publicist and critic in this diversity of criterion. He pays his money and takes his choice when selecting a particular administration or country for attack. If its percentage development is high he may be able to point to the poor total number of telephones in use; if the total number of telephones is good, he can gird at the low percentage of increase. And so on, *ad infinitum*.

We have been moved to these remarks by the consideration of another basis of comparison which at present is seldom employed in telephone statistics. We refer to the number of telephones per square mile, a very fair criterion, we think, of the telephonic development of a country. In this, countries with the wide open spaces necessarily suffer in comparison with compact, highly-cultivated countries, in which there is little mountain or prairie territory, and it is not surprising to find Holland, Belgium, Denmark and Great Britain neck and neck for first place on the list. The latest figures available are: Holland 22.8 telephones per square mile, Belgium 22, Denmark 21.4, Great Britain 21.2, Switzerland 18, Germany 17, Japan 7, Austria 6.7, United States of America 6.6, France 5, Sweden 3, New Zealand 1.5, Norway 1.5. No other country with a fairly high telephone development possesses 1 telephone per square mile. Canada and Australia, which cut so good a figure in respect of telephones per population, are too heavily handicapped by their wide unpopulous regions, and by the fact that the inhabitants of the one are settled in a definite comparatively narrow belt, and of the other more or less near the coast. It is, of course, necessary to make allowances of this kind when making comparisons in any kind of statistics, but we do not notice that our critics make any allowance for Great Britain's position in the table of telephones per hundred inhabitants. That position at present is, as the public have been informed *ad nauseum*, No. 10, but no allowance is made for the fact that the telephone was invented and had a good start in A, or that we have a better-developed telegraph system than B, a better and more widely extended railway system than C, and less scattered and isolated rural communities than D, and so forth and so on. We notice that a Member of Parliament, writing to the papers recently, stated that Great Britain ought to be first on the list. This is a very proper and patriotic aspiration, and one which we heartily second. We do not, however, find that people sleep less soundly in their beds because this country has fewer motor cars *per capita* than America, fewer miles of railway per square kilometre than Belgium, fewer (oh, incomparably fewer!) opera-houses than Germany. We might extend the list indefinitely.

HIC ET UBIQUE.

STILL the legend grows. Not long since we learned that Mr. Asquith (the late Lord Oxford) disliked the telephone. We are now informed by a gossip paragraphist that "throughout Lord Oxford's long and busy life he was never once induced to speak over the telephone." Possibly he compromised by speaking *through* it, but that is by the way. We have heard the same story of Mr. Gladstone and Lord Salisbury, and we can assure our readers, with our hands on our hearts, that neither Palmerston nor Peel, Pitt nor Fox, ever spoke over the telephone. Our paragraphist goes on to inform us that Mr. Kreuger, the "elusive multi-millionaire match king," holds the telephone in aversion. This is singular, because Mr. Kreuger is also a "telephone-king" closely associated with all the Ericsson ventures, according to a German authority. We are informed of his houses and palaces, and roof-gardens, and *hotels particuliers*, but not of the interesting fact we have mentioned.

The annual accounts and statistics of the Guernsey States Telephone Department show an increase of 146 telephone stations in 1930 (from 4,353 to 4,499). They also show a credit balance after allowing for depreciation and sinking fund of £265 5s. 9d.

We deeply regret to hear of the death, last month, of Mrs. G. F. Preston, wife of a former Controller of the London Telephone Service. Mrs. Preston, who was known to many of our readers, died suddenly, just as Mr. Preston, who had been seriously ill, was making progress. We offer him our sincere sympathy in his loss.

Sir Charles Bright, F.R.S.E., M.Inst.C.E., well known to all telegraph men, and author of many works on telegraphy and especially submarine cables, has written a book in the interests of various Good Causes, which is published by Messrs. Geo. Routledge & Sons, Ltd. at 4s. 6d. net. The work is entitled "Let's Help!" and deals with all those organisations whose aim is to do good and assist in furthering the general welfare. It is designed to furnish the necessary knowledge to all who may desire and be able to assist such bodies.

Considerable progress was made in the overseas telephone services during the past six weeks. Not only was the service to Uruguay extended to include Rosario, Colonia, and Colonia Suiza, and the Anglo-Italian service to all parts of Italy (including Sicily), but new services were opened to the Canary Isles (unit call of 3 minutes, £1 14s. 6d.) on Mar. 12 and to French Morocco (Rabat and Casablanca) on the 5th (unit call of 3 minutes, £1 4s. 0d.). Before these lines are in print a service will be opened between all parts of Great Britain and Ireland, and Saigon and Cholon (Cochin China) and Pnom Penh (Cambodia). The charge will be £4 16s. 0d. for a unit call of 3 minutes.

Telephone communication with the Channel Islands was opened on Mar. 26, service being provided between the principal places on the mainland and St. Peter Port (Guernsey) and St. Helier (Jersey).

According to the *Annales des Postes Télégraphes et Téléphones*, Dec. 31 last, 42,000 out of 185,000 subscribers in Paris (about 23%) were connected with automatic exchanges, viz., Carnot, Gobeliuss, Diderot, Vaugirard, Wagram, and Trudaine. The conversion of 9 others is expected in 1931 (Passy, Danton, Nord, Combat, Botzaris, Archives, Turbigo, Odéon, and Segur) which will bring the number of subscribers working on the automatic system to 50%.

One of those heroic reformers who never count the cost writes to the press from Liverpool as follows:—

If telephones are to be a universal success the G.P.O. must reduce their rent of 2s. 6d. per week, which means £6 10s. a year, to a licence fee of £1 per year.

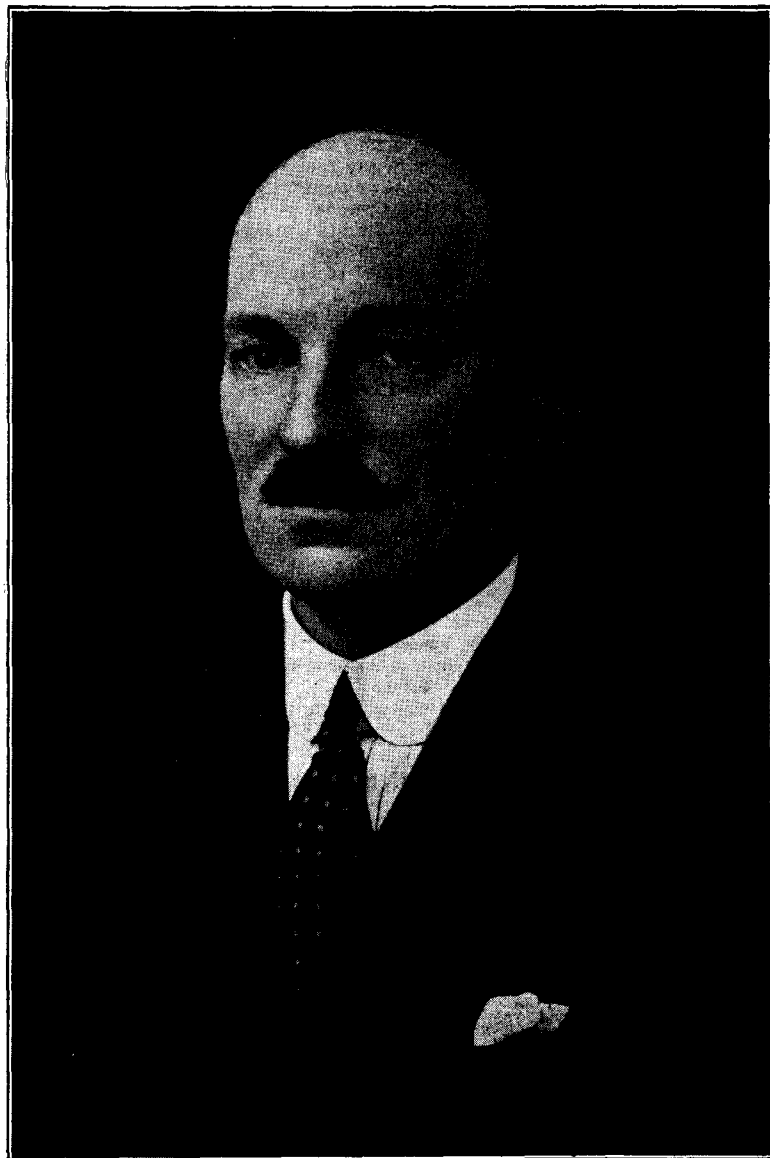
Many people would then have telephones and trade would benefit. It is the high rental which holds them back, for it is just as much a charge on the income of the ordinary householder as coal or light.

We must confess that we envy Liverpoolians if they get their coal and their lighting for £1 a year apiece!

Our Sheffield correspondent sends us the following copy of a letter received in the District Office:—

Sir,—My "Boss" (a so-called wife!) paid your account yesterday, of £....., and saw in it a call on Nov. 7 of I think 3s., and *she* being from home then, wanted to know who I had been phoning to!! and like her!!! well; I could not tell her so far back so now, write to you, to beg of you to get one of your men to look back in one of your books, and let "poor me" know, who it was to, and I have enclosed a stamped addressed (old envelope) to you for your kindness, should you be able to do this *kind action* for one with "pecks" of thanks, from an old, Lincolnshire farmer, (existing still!).—Yours truly,

We are glad to think that the Telephone Service is turned to in all times of trouble.



[Photograph by J. Russell & Sons, London.]

MR. C. R. ATTLEE, M.P., THE NEW POSTMASTER-GENERAL.

TELEPHONE FINANCE.

By SIR HENRY BUNBURY, K.C.B. (*Comptroller and Accountant-General of the Post Office*).

A paper read before the Telephone and Telegraph Society of London, Feb. 16, 1931.

It is just three years since your Society did me the honour to invite me to address you on the subject of Telephone Finance. Three years in the life of the Telephone Service is not a very long time, but as it happens, they have been three particularly interesting years. What I propose to do, therefore, is to take up the story where I left it in January, 1928, and to consider what has been happening as regards the financial aspect of the Telephone Service, since that time.

I think it is wise to look on the financial history of a business or service not as though it were something which is past and done with, but as something which contains within itself the seed of future events and developments. We are not concerned in making a *post-mortem* but rather in studying some of the forces which will go to determine the character and progress of the Telephone Service of to-morrow. There is all the difference in the world between the effects of a sound financial policy and those of an unsound financial policy. Improvidence on the one hand and what I will call financial costiveness on the other hand, will surely have their effects sooner or later on the general character of the service and on the nature and rate of its development.

The four elementary factors in the financial policy of a progressive utility service such as Telephones, are, I think, these:—

- (a) How much money you spend.
- (b) When you spend it.
- (c) What you spend it on.
- (d) Whether you get value for it.

A little reflection will show that these four things, in the long run, determine the content or dimensions of your tariff of charges to the public. The form of your tariff or tariffs is a separate matter; of great importance, but one which is outside the scope of my remarks this evening, and I shall not refer to it again. But the content or dimensions of your tariff determine in a large degree the volume of the business you are going to obtain, and that in turn determines the amount of employment which you are going to give. So the finance of our Telephone Service is by no means a merely academic matter; merely something of interest to accountants and statisticians. On the contrary, it has a vital interest for all who are concerned in the management and operation of the service.

So much by way of preliminaries. I will pass now to the position as we left it in 1928.

If you remember, I then pointed out that owing to the increasing cost of the average unit of new telephone plant, together with the increasing financial burden created by the replacement of old plant installed at pre-war prices by new plant installed at post-war prices, the average cost of telephone equipment per telephone (that is, per revenue-producing unit) was steadily rising. Substantial reductions had been made in 1922, 1923, and 1924 in the rates of charge to the public, and the result of these two factors in combination was that the margin of profit in the Telephone Service was rapidly shrinking. In fact, had it not been for the fall in the cost of living bonus, which caused a marked diminution in the cost of operating and maintenance, we should have been confronted with a telephone deficit. The position in 1928 was that the rise in the average cost of plant per telephone, so far as it was due to the excess cost of renewals, seemed bound to continue until about 1936. Consequently, it was an open question whether we should be able to maintain the existing tariff; whether, in fact, we should be able to preserve our proud reputation of being one of the few telephone undertakings in the world which during the past decade, instead of increasing their charges to the consumer, have been able to maintain and even to reduce them.

The following table shows what the expenditure, the revenue, and the surplus have been doing from 1922-3 to 1929-30.

TABLE I.—SUMMARY OF WORKING RESULTS.

Year.	Average Cost of Living Index.	Expenditure* (including interest).	Revenue.	Surplus.
(1)	(2)	(3)	(4)	(5)
		£	£	£
1922-23	93	12,791,000	14,035,000	1,244,000
1923-24	77½	12,866,000	14,584,000	1,718,000
1924-25	77½	14,154,000	15,006,000	852,000
1925-26	77½	15,607,000	16,163,000	556,000
1926-27	75	17,204,000	17,488,000	284,000
1927-28	74½	18,767,000	18,875,000	108,000
1928-29	67½	19,804,000	20,329,000	525,000
1929-30	70	21,379,000	21,892,000	513,000

* "Sutton" payments excluded.

Side by side with Table I, I will put Table II, which shows the steady increase in the proportion of the revenue which is taken up to meet charges in respect of plant. With the significance of the figures for the last three years I will deal presently.

TABLE II.—RELATION OF FIXED PLANT CHARGES TO REVENUE.

Year.	Revenue.	Fixed Plant Charges (Interest and Depreciation).	Column (3) as a percentage of Column (2).
(1)	(2)	(3)	(4)
	£	£	%
1922-23	14,035,000	4,725,000	33.7
1923-24	14,584,000	5,128,000	35.2
1924-25	15,006,000	5,879,000	39.2
1925-26	16,163,000	6,886,000	42.6
1926-27	17,488,000	7,914,000	45.3
1927-28	18,875,000	8,870,000	47.0
1928-29	20,329,000	9,739,000	47.9
1929-30	21,892,000	10,565,000	48.3

I hope you will agree that these two tables confirm the foregoing remarks.

Such, then, was the position in 1928. We had reached a critical point, and I ventured then to express the opinion that we could only hope to escape financial embarrassment if one or more of four things should happen:—

- (a) a fall in the cost of living;
- (b) a fall in the cost of plant;
- (c) net savings in operating cost due to the substitution of automatic for manual equipment;
- (d) accelerated growth of revenue in relation to the capital outlay.

The figures which I am going to give you will show that fortune and our own efforts have brought us safely through the dangers of this critical point. We have not yet had the accelerated growth of revenue in relation to capital, but there has been some fall in the cost of living, a fall in the cost of plant, due partly to lower prices and partly to the remarkable improvement in standards of performance in the Engineering Department; and there may have been (though I am not in a position to speak definitely on this) some realised net saving due to the introduction of automatic plant. The result of the operation of these factors during the last three years is brought out rather strikingly in the table which follows:—

TABLE III.—EXPENDITURE UNDER MAIN HEADS AS A PERCENTAGE OF REVENUE.

Year.	Administra- tion, Operating, &c.	Mainten- ance.	Accommoda- tion.	Miscellaneous (Travelling, Stationery, Printing, &c.).	Fixed Plant Charges (Depreciation and Interest).
(1)	(2)	(3)	(4)	(5)	(6)
	%	%	%	%	%
1922-23	33.5	17.6	4.8	1.5	33.7
1923-24	30.9	15.6	4.9	1.7	35.2
1924-25	32.0	16.0	5.2	1.9	39.2
1925-26	30.9	15.8	5.3	2.0	42.6
1926-27	30.4	15.4	5.4	1.9	45.3
1927-28	30.1	15.6	5.3	1.4	47.0
1928-29	28.4	14.2	5.3	1.6	47.9
1929-30	28.0	14.1	5.6	1.5	48.3

This table brings out two facts, viz., (1) that the rate of growth of the burden of fixed plant charges on the revenue has diminished in a marked degree; and (2) that the burden of administration, operating and maintenance expenses on revenue is continuing to fall. In fact, if you compare the year 1929-30 with the year 1926-27, you will see that the reduction in administration, operating and maintenance, is greater than the increase in the fixed plant charges.

In the next table which I am going to produce, the working of these factors is analysed in more detail, and we shall see more clearly the direction in which we are going:—

TABLE IV.—AVERAGE CAPITAL COSTS PER STATION.

Year.	Excluding Excess Renewals.	Excess Renewals.	Total.	Increase per cent.	Cost per added Station (excluding Excess Renewals).	Annual Charge per Station (on mean number) for deprecia- tion and interest.	Increase per cent.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	£	£	£		£	£	
1923-24	56.4	5.6	62.0	—	70.7	4.64	—
1924-25	58.9	6.3	65.2	4.83	82.9	4.83	4.09
1925-26	61.8	7.0	68.8	5.52	93.8	5.17	7.04
1926-27	63.2	7.6	70.8	2.91	80.3	5.46	5.61
1927-28	64.2	8.1	72.3	2.12	76.4	5.65	3.48
1928-29	65.0	8.4	73.4	1.38	74.9	5.75	1.77
1929-30	65.3	8.6	73.9	.68	70.1	5.81	1.04

This table requires rather more explanation. It starts with the year 1923-24, because, unfortunately, I have not been able to get out complete data for the earlier year; I may however mention, that at 31st March, 1920—that is, at about the point when the post-war reconstruction and development phase began, the average capital cost of plant was £43.5 per station (column 2 of the table) and of excess renewals £0.6 per station (column 3) total £44.1 per station (column 4).

The first thing to bear in mind about this table is that it is expressed in terms of the telephone station as the unit. The reason for this is that the telephone station is the thing which produces the revenue; the revenue-producing unit. Later on I shall have something to say about the *amount* of revenue which this unit on average has been producing; for the moment, what we are concerned with is the cost of equipping ourselves with these revenue earning units. In column 4 is shown the average cost of all existing telephone stations in our system at the end of each year, and you will notice that it has been steadily rising, from £44.1 at Mar. 31, 1920, to £73.9 at Mar. 31, 1930. This figure is, however, made up of two components which it is convenient to separate, because their movement is determined by different factors. Column 2 gives the original prime cost per station; column 3 gives the additional amount per station which it is necessary to add to that original prime cost by reason of the fact that renewed plant has been costing more to renew than its original prime cost. Our depreciation system provides for the wastage of capital involved in the exhaustion of the life of the unit of plant, or, in other words, for the replacement of exhausted plant at its original first cost; but it does not provide for the extra cost which is incurred by reason of the fact that prices have risen and that pre-war plant has to be replaced at a higher post-war cost. That excess cost of renewal is shown in column 3, which discloses the average cost per telephone station, over the system as a whole, which is due to this factor. It is additional expenditure which has to be incurred without any addition to revenue earning capacity. You will observe that for a time it grew very rapidly, but that it is now flattening out. That flattening out is due partly to a fall in costs, but mainly to the fact that the proportion which renewals bear to the size of the system as a whole is itself diminishing. These renewals will continue to be a fairly heavy burden on the undertaking for some years to come—at least until 1936; but the indications are that that burden, expressed as a cost per telephone, has become stabilised and after 1936 should begin to diminish.

Column 6 shows the additional capital expenditure year by year in terms of added stations, or, to put it in another way, the capital expenditure we incur for each actual revenue producing unit we succeed in adding to our system.

Column 7 is really column 4 expressed in terms of annual charges per station, and, of course, gives effect to the rate of interest we have to pay for the capital expended year by year, and to any shift in the incidence of the depreciation burden, owing to differences in the proportion of plant of various kinds provided in particular years.

What one observes from this table is as follows. In the first place the rate of growth in the average capital investment per station and in the average annual charges per station is steadily falling. In the second place (and this is even more significant) the cost per added station is now very little more than the average cost of all stations, and in view of the further decline in costs which we seem likely to realise, I am optimistic enough to think that we have about reached the peak in the average cost of our revenue producing units. It is a very good thing, for us and the consumer, that we have.

My last table shows, over the same series of years, the total average expenditure and the total average revenue per telephone. Here we take not only plant charges but all the expenditure which enters into the process of providing telephone service; and against it we set the average revenue produced per telephone:—

TABLE V.—ALL-IN OPERATING COST (INCLUDING DEPRECIATION AND INTEREST) AND REVENUE PER STATION (ON MEAN NUMBER OF STATIONS).

Year.	PER STATION.	
	Total Operating Cost.	Total Revenue.
(1)	(2)	(3)
	£	£
1923-24	11.65	13.20
1924-25	11.64	12.34
1925-26	11.72	12.13
1926-27	11.87	12.07
1927-28	11.95	12.02
1928-29	11.69	12.01
1929-30	11.76	12.04

What you have to notice here is that throughout the period the expenditure per telephone has not fluctuated very greatly, the rise in plant costs being very nearly compensated for by the savings in administrative, operating and maintenance costs. Equally, as soon as the effect of the considerable reductions in rates made in 1923 and 1924 had disappeared, the average revenue per telephone became pretty stable. What in fact has happened is that the financial effect of the decline in the calling rate, and the disproportionate growth in residential subscribers who pay a lower rate of installation rental, has been counterbalanced by the abnormally rapid development of trunk, and especially overseas trunk, business. It would not, however, be safe to assume that the downward tendency of the average revenue per telephone will not continue as the service develops more and more among the smaller residential subscribers with their comparatively limited use of the service. We have still to solve the old problem—can people be induced to make more use of their telephones, and if so, how?

So far, I think you will agree that the picture which I have presented is, from a purely financial point of view, not unsatisfactory on the whole. We have now, however, to face a new situation. Just as in 1928 we were at a critical point brought about by the marked and persistent growth of

plant costs, so now we are at another critical point brought about by the intense industrial depression. What will happen if the growth of subscribers and of call fee revenue, on which we have hitherto been able to rely year by year, is, temporarily at any rate, suspended? Or to put it in another way, if the gap between equipment provided and equipment taken up and/or used by the public increases? We have, as you have seen, not a very large margin to play with.

Well, mystery novels are very much in vogue now-a-days, and I will leave you with this problem to solve for yourselves, assuring you that you have in these tables all, or nearly all, the clues you need in order to find its solution.

PROGRESS OF THE TELEPHONE SYSTEM.

The total number of telephone stations in the Post Office system at Jan. 31, 1931, was 1,961,941, representing a net increase of 4,251 on the total at the end of the previous month.

The growth for the month of January is summarised below:—

Telephone Stations—	London.	Provinces.
Total at Jan. 31, 1931	705,511	1,256,430
Net increase	2,279	1,972
Residence Rate Subscribers—		
Total	178,685	278,568
Net increase	1,132	2,844
Call Office Stations (including Kiosks)—		
Total	6,711	27,388
Net increase	103	141
Kiosks—		
Total	2,211	7,642
Net increase	50	110
Rural Party Line Stations—		
Total	—	9,265
Rural Railway Stations connected with Exchange System—		
Total	17	1,930
Net increase	—	23

The total number of inland trunk calls dealt with in November, 1930 (the latest statistics available) was 9,579,041, as compared with 9,667,997 in November, 1929.

Outgoing international calls in November, 1930, numbered 43,495, and incoming international calls 46,376, the figures for the corresponding month of the previous year being 47,814 and 52,193 respectively.

Further progress was made during the month of February with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Pollards (Norbury) (automatic).

PROVINCES—Rawdon, Worthing (both manual); Allesley (Coventry), Asbury (Swindon), Bletchington (Reading), Burgh-on-Bain (Louth), Drummur (Aberdeen), Field (Uttoxeter), Lastingham (Pickering), Madderty (Crieff), Middleton Stoney (Bicester), Sicklesmere (Bury St. Edmunds), Steventon (Abingdon), Talybont-on-Usk (Gloucester), Teviotsdale (Hawick), Ulgham (Morpeth), Whaddon (Leighton Buzzard) (all rural automatic),

and among the more important exchanges extended were:—

LONDON—Buckhurst (manual).

PROVINCES—Idle, Luton, Oswestry, Radlett, Weymouth (all manual).

During the month the following addition to the main underground system was completed and brought into use:—

Aylesbury—Winslow,

while 71 new overhead trunk circuits were completed, and 74 additional circuits were provided by means of spare wires in underground cables.

LONG DISTANCE TELEPHONY IN THE U.S.A.

By W. C. GRIFFITH.

(Continued from page 125.)

THE other classes of calls which require handling of special type are calls on which advantage is taken of the various special facilities which are offered.

The first of these I will mention is the class of call booked by name and address instead of the called number being quoted. There is a very high percentage of such traffic in certain places. At Memphis, for example, (an extreme case, admittedly) of every 100 demands the required number is given in only 29 cases. Of the remainder, in 57 cases the required number is obtained at the local information desk before the call is passed forward, 3 numbers are obtained at the terminal exchange and 11 calls fail.

The method of handling this traffic is to refer to the route file which indicates whether information work for the exchange in question is done by reference to directories held locally (which is indicated by the letter "D" in the route information file to which I have previously referred) or whether the demand is passed forward as received and the number supplied at the terminal exchange. This latter method is employed in respect of calls to small exchanges where the operators know practically every subscriber and reference to records is thus avoided. In the case of calls to hotels and to well-known firms no effort is ever made to trace the number at the originating point, e.g., the equivalent of a call from Newcastle to Huntley & Palmer, Reading, demanded without the number being given would be passed by name, it being assumed that the Reading incoming operator would know the number.

If the terminal exchange is marked "D" in the route list, the controlling operator calls her local information desk on a straightforward junction and secures the number from directories held there. The booking of a call by name does not in any case make any difference to the effort to complete it on demand. To keep this directory work down, the telephone companies issue cards to long distance users, asking them to name their distant correspondents and return the cards for the numbers to be put in. The cards are then sent back to the subscribers with these inserted.

The personal call is very freely employed in the United States. Fig. 2 shows the high percentage of personal call work. The personal call charge is about 25% higher than the day station-to-station charge. The higher percentage of personal calls during the day period is due to the fact that there is no reduction in the person-to-person charge at night, and as night rates are 60% day rates the person-to-person call at night costs more than twice as much as the station-to-station call.

The called person is obtained on the first attempt in some 65% of the cases, and, in these circumstances, the personal call supplementary charge is, of course, clear profit for the company. On the other hand, there is practically no limit to the trouble which the companies will take to trace the required party in the other 35%. The percentage of calls completed to calls booked is most carefully watched and every effort is made to increase the figure, which is now 90.8%. As an example of the trouble taken to make calls effective, I may quote a case I observed.

While listening-in to operating in Washington, I heard a subscriber explain to the long distance operator that he was anxious about his wife and wanted news of her. It appeared that the lady had left in the car a couple of days previously to go to a seaside bungalow and he had had no word from her. He knew there was no telephone at the bungalow but there was a village store near which he thought probably had one, and if he could ascertain that his wife had been in to buy supplies, he would know that she had arrived safely. I can make clear the steps then taken (as a matter of course, without question entirely on the initiative of the long distance operator, the subscriber having been released) if I use the names of English places more or less equivalently situated geographically. We will suppose that the request was made by a London subscriber who knew no more than that his wife had gone to a bungalow at a place called Coombe, Cornwall, but had no precise idea where it was or the name of the village store, or if it really had a telephone or the exchange to which it would be connected if it had. The first step drew blank—Coombe was not in any directory. Then the operator called Plymouth; Plymouth had never heard of Coombe. Then a call to Falmouth; Falmouth trunks engaged, so the alternative route to Falmouth, via Birmingham, was tried. No lines available, Birmingham—Falmouth, so the second alternative, via Newcastle, was tried and Falmouth reached successfully. (Direct circuits between the points named must be understood.) But Falmouth had never heard of Coombe. Then enquiries, by separate calls, to Truro, Penzance, Newquay, and Bude, all blank—no knowledge of Coombe anywhere. Call referred to supervisor in London; no help. Then, before being abandoned, reported to Chief Supervisor—yes, the Chief Supervisor had, as it happened, once spent a holiday there and knew the place. If there was a telephone, it would work on an exchange called "Stratton." Call to Stratton via Okehampton; yes, there was a party line to Coombe with the village store there as one of the stations. The calling subscriber was duly connected—yes the lady had been in buying supplies. All well. That call took the whole of the operator's time for half an hour and involved the use of over 2,000 miles of trunk line in the aggregate. The telephone company received, in fees, the equivalent

of the night station-to-station rate for a call from London to Stratton, 3s., and, in goodwill, who shall say how much?

Another class of call which is a great convenience to subscribers is the "collect" call, that is a call on which the charges are debited to a line other than the calling line—usually, but not necessarily, the called line. The calling subscriber books his call "collect" and the called subscriber is asked, before the call is connected, whether he will accept responsibility for the charges. 6.5% of all long distance traffic is completed on this basis. The companies emphasize its utility, suggesting, for example, that parents shall instruct their children at boarding school to call home "collect" at intervals. The service is also available from call offices and a caller can have a call office call debited to the called subscriber, if he will accept that responsibility, or to another line in the same originating area—e.g., a business man out in the city can make a long distance call and have it charged to his business, so that no money need be paid at the time—a factor which always tends to stimulate business in these days.

The American operating methods described are, in fact, specially likely to foster call office traffic. Service on demand is obviously useful to a subscriber, but to a caller its convenience is paramount. To be able to step into any call office and speak anywhere in the United States on demand necessarily attracts this class of business. Long distance call traffic is encouraged also by the method of collecting the charges. As mentioned these can be debited to another line, but in cases where the caller pays he is asked to deposit in the coin box in advance only the fee for a three-minute call. When the period has elapsed he is asked if he wishes to continue, and if so to flash at the end of the conversation, when the operator enters circuit, informs him of the total duration, and asks for the fee due for the excess period to be deposited in the box. This method of operating obviously leaves opportunity for avoidance of the payment for any excess period, for the caller may decamp. The companies take the view, however, that the facility brings more revenue than it loses. The only alternatives after all are to cut the caller off at the end of the period first paid for (which is the British method) or to interrupt the conversation while extra money is collected. This latter course would, however, probably cost more in wasted line time than was collected, and in any event is most inconvenient when the unit for extended periods is one minute. The method is a striking example of the policy which pervades the whole American telephone service—to make it easy to make calls.

The assessment of the charge due from an extended call, or the total charge due on an ordinary call when this is asked for is obtained from a table supplied to each operator. The route and rate table gives the day station-to-station charge in respect of each distant exchange. That basic charge can be translated at once into the evening rate, night rate, or person-to-person rate for a call of any duration by means of this table. For example, the charge for a night call of 12 minutes when the day station-to-station rate is \$1 for 3 minutes is obtained by seeing that the initial night charge is 60 c. and by seeing on the table that the charge for a 12-minute call with 60 c. for the initial period is \$2.40.

While on the subject of charges I might mention that timing is by calculagraph, that there is no interruption or intimation of the passage of time during a call, and that disputes and inaccuracies, as shown by service observations, are very few, due, no doubt, to the low loads enabling operators to time on and off correctly. A subscriber may limit his liability by specifying in advance the maximum time for which he desires to speak, in which event he will be challenged at the end of that period.

An ordinary example of call office service which came to our notice will serve as an illustration of call office working. We had ten minutes to wait before our train left Chicago for Detroit, and the A. T. & T. Co.'s representative, who was travelling around with us, thought he would take the opportunity to speak to his home in Long Island, New York. He went to a call office cabinet, asked for his home "collect," had a conversation with his wife, and rejoined us within 5 minutes. This is equivalent in distance to a call from London to Warsaw, Buda Pesth or Rome, made from a call office, because one chanced to have ten minutes to spare before a train started! On this call no money was paid at the time, the call being demanded "collect" and the charge appearing on the bill of the called line.

When listening-in to the long distance operating, I was at first struck with the wide circle of the acquaintances of the operator—she appeared to know everyone—"Yes, Mr. Jones, I'll get them for you"; "Mr. Brown, I'm sorry, but Mr. Smith is out." It was only when I realised that every operator did the same thing and that every operator could not know everybody personally, that I found that it is a normal feature of long distance operating to address every subscriber by name on every occasion, when the name is known, as is so frequently the case when there is so much person-to-person traffic. The effect is remarkable. An impression of personal touch, of friendliness, of desire to help is given which nothing else could possibly give in quite the same way, and the creation of such an impression is part of the consistent general policy of the companies in all their contacts with the public.

Another operating feature of interest, which also has a favourable reaction, is that subscribers are allowed to overhear the operation of their calls. If, for instance, a subscriber asks for a call without giving the number, he hears his operator ask the directory operator for it, hears the number given (and may note it for future use). It may be that the directory operator may not be able to trace the name and may ask for further information. Her enquiry does not have to be repeated by the long distance operator to the subscriber, since it is heard by him direct and he can answer for himself. Similarly, all other operations can be heard by the callers, who thus realise what progress is being made instead of being left, as it were, "in the air" listening at a dead instrument.

A facility of occasional utility is the messenger service. If a person asked for by name and address (i.e. without number) is found to have no telephone, an offer is made to advise him by messenger that he is wanted on the telephone. One member of our party experienced the benefit of this service. He desired to speak from Chicago to a relative in Winnipeg. The reply came back that the called party had no telephone, should a messenger be sent? This being agreed to the called party was notified that he was wanted on the telephone for a call from Chicago. He came to a telephone, notified that he was available, this information was passed back to the Winnipeg position in the Chicago exchange, where the ticket was waiting, and the call duly completed.

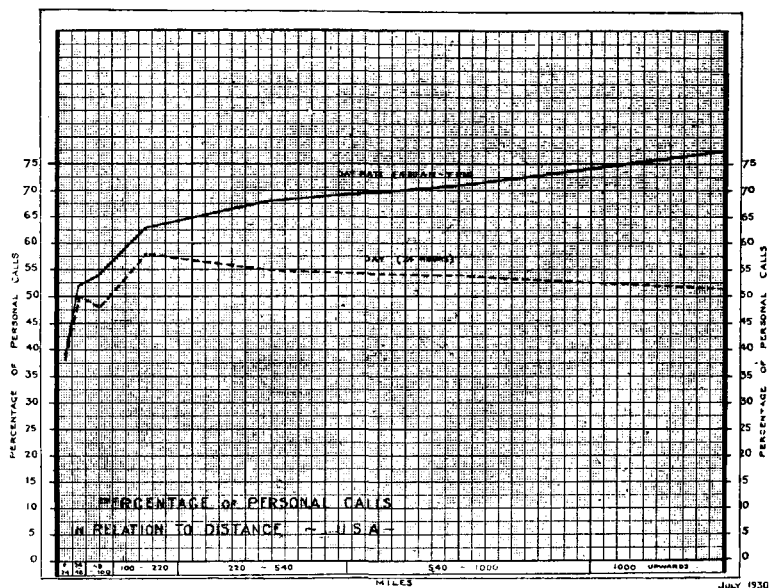


FIG. 2.—PERCENTAGE OF PERSONAL CALLS.

The standard of transmission is very high and is maintained by means of line repeaters, and, when long distance circuits are joined in series on indirect calls, by means of repeaters inserted at the intermediate exchange. The route information cards give particulars as to the use of repeaters, and if a through connexion requiring their use is made, the controlling operator asks the intermediate exchange for the distant exchange "with repeater." The intermediate exchange then makes the through connexion with a pair of cords with a repeater in circuit. A development of this practice, however, dispenses with repeater cord circuits entirely. The circuits designed for carrying through traffic are equipped with terminal repeaters at the incoming end, and these repeaters are automatically brought into use whenever the circuit in question is connected through to another long distance circuit, but are automatically suppressed whenever the circuit in question is joined through to a local junction, no special action on the part of the intermediate operator being necessary.

In some very large trunk exchanges there is neither space nor necessity to multiple all the outgoing lines over all the long distance positions. In such cases a few of the lines in each group appear on each suite of positions, different lines on different suites, and all the lines appear on a suite of tandem positions. An operator requiring a line in a group first attempts to use one in the limited group before her; failing that she goes to the tandem suite over a straightforward junction and thus obtains access to the balance of the group. If the tandem operator has no line available she plugs the line on which she received the demand into an overflow jack associated with the group required. This is associated with a device which causes a flash to be given to the demand operator who made the application as soon as any circuit in the group required becomes free, and this operator then makes a new application to the tandem operator for a line in the group, knowing one to be free. This arrangement saves much waste of time on the part of demand and tandem operators as a result of the elimination of ineffective repeated demands and expedites calls in that a circuit can be secured directly one becomes free.

The day charges for given distances in America are very similar to the charges in this country at par rates of exchange. It should be realised, however, that the par rate of exchange, about \$5 to the £1, does not by any means represent the relative spending capacity of the two nations. Prices and incomes average more nearly double in the States, and \$9 to the £1 probably represents more nearly the value of money, and on this basis American long distance tariffs are substantially lower than our own.

Reduced rates are offered outside the busy hours as in this country, but on a less generous basis. While in this country there is a reduction to 75% at 2 p.m. and a reduction to 50% from 7 p.m. to 7 a.m., in America there is no reduction till 7 p.m. when charges fall to about 80%, followed by a reduction to 60% from 8.30 to 4.30 a.m.

A natural question arises from the similarity of American and British basic rates. How is it that the A. T. & T. Co. can give such a fine service,

employing more staff per call, supplying magnificent buildings, elaborate equipment, and pay its staff about double in cash (i.e., about equivalent in purchasing power) pay a fine dividend and yet charge no more than we in this country?

The answer lies in the information given in Fig. 3, which shows load lines for two American exchanges, Washington and Detroit. The effect of the maintenance of demand throughout the day is that whereas the ratio of day traffic to busy hour traffic is only some 6.5 in this country, it reaches 10.0 in America, and every piece of American plant can thus earn some 50% more revenue than the corresponding British plant. A trunk group earning £100 per day in this country would earn £150 if the British subscriber had American telephone habits. The enormous advantage which this gives the American companies will readily be appreciated. 50% more revenue from the same capital expenditure is an inestimable advantage and is sufficient to cover all the extra costs to which I have referred.

Unfortunately an improvement in this factor cannot be obtained by order and it forms a striking example of that difference in conditions between America and this country to which I referred at the beginning of this talk, and which makes so unsafe any suggestion that if we were to adopt American methods in their entirety we should necessarily get American results. The difference is in the main due to factors which are either fixed or are only slightly susceptible to any influence which the telephone administration can bring to bear. There are greater distances, which make waiting for reduced tariffs worth while. A business man in this country will not wait for some hours to save 6d. An American may to save \$1 on his longer distance call. Time differences have an influence. There is a maximum possible time difference of 4 hours between two places in the States and this tends to spread traffic. The strongest factor is, however, the high development of the telephone habit. The American takes to the telephone like a duck to water and uses it for all purposes and therefore at all hours.

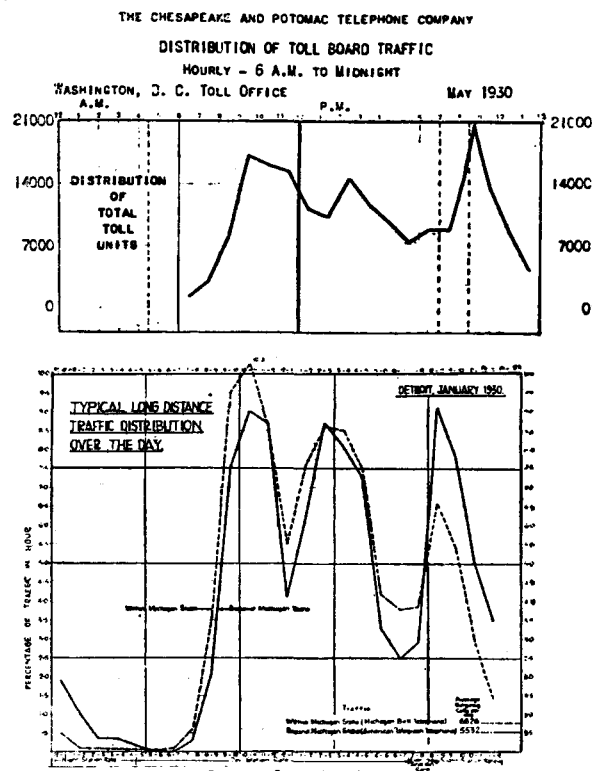


FIG. 3.—TYPICAL LOAD LINES.

While on the subject of spread over of demand I may mention a factor of some interest. Some of you will have heard a broadcast from Chicago on New Year's eve of Amos 'n' Andy, two Americans who impersonate niggers. These two give and have given for the last four years a turn on the National Broadcasting chain from 7 to 7.15 p.m. every evening (in the interests I may mention of Pepsodent tooth paste) and so great a hold have they secured on the American public that telephone traffic, including long distance traffic, shows an appreciable fall during this period in spite of the fact that it is at the beginning of the first reduced rate period. This "turn" must represent a considerable loss to the telephone companies even though it represents a profit of £2,000 a week to Amos 'n' Andy.

A few facts about loads and staff may be of interest. Loads on the demand positions expressed in terms of calls per hour are very low, ranging from about 6 to about 10, where a load of 30 to 40 would be expected in this country. Direct comparison is, however, misleading, as the American traffic includes such a high percentage of personal calls. Nevertheless, it is clear that American loads on control positions are kept low in order that a very high quality of service can be given—such in fact is necessary when an operator has in hand the setting up of only one call at one time. On incoming positions, however, and especially on tandem positions, very high loads are carried.

Female operators are employed exclusively and are recruited definitely for long distance work. The method of training is interesting. A new entrant is put at once at a switchboard in parallel with an experienced operator and is expected to commence the simpler operation of calls, such as taking the numbers, within an hour, assuming gradually a larger and larger proportion of the operating of each call. The average rate of staff wastage is about 38% per annum in spite of the fact that resignation is not required on marriage or maternity. The companies take the view on this question that a trained operator represents an investment of training costs and that they have no desire to lose the value of that investment so long as they secure efficient service. In fact only some 25% of the operators do resign on marriage.

The first thing which strikes a British visitor to an American exchange is the scale on which accommodation is provided, both in respect of architecture and fittings. These appear elaborate in the extreme. On the other hand, telephone buildings and accommodation in America do no more than conform to the highest type provided by other first-class business houses, a condition which, with some unfortunate exceptions, may be said to exist on this side. In considering this question of welfare accommodation, it must be remembered firstly that split duties are worked in America even in the largest cities, and that there is more demand for rest room accommodation accordingly.

Dining arrangements are very similar to our own, but all dining clubs work on the cafeteria system, and the dining rooms are in general lighter and more cheerful because the standard of building maintenance is very much higher than on this side.

We were assured that before advertising was started the American telephone companies received all the uninformed and sometimes malicious criticism, over and above legitimate complaint, to which we are now so often subjected, but that publicity had changed all that. Certainly the standing of the telephone companies in the eyes of the public is now of the highest. An example of the public goodwill came to our notice on one occasion. Some critical remarks on automatic telephones in Congress were made by a Member and naturally received wide publicity. Immediately there was a vigorous response from the public in the Press, almost wholly favourable to the telephone administration. The Telephone Company thus scored heavily without any move on their own part.

Lately telephone advertising has become more direct in bringing the advantages and uses of the service before the public notice. Fig. 5 is an example. This advertisement emphasises the opportunity which the long distance service gives to keep in touch with home and business while on holiday.

The high standing of the companies has its reaction in other ways. It attracts the very best class of employee, which enables a high standard of service to be given; it creates *esprit-de-corps* amongst employees which again re-acts in willing service. All telephone employees are proud of their employment and of their company. Service with the telephone company represents a definite standard of efficiency in American business life.

You have all heard, no doubt, of the "Spirit of Service" as applied to American companies. You may have thought it an advertising catch phrase. It certainly is not in the Bell Telephone Service. It is a real, live, active

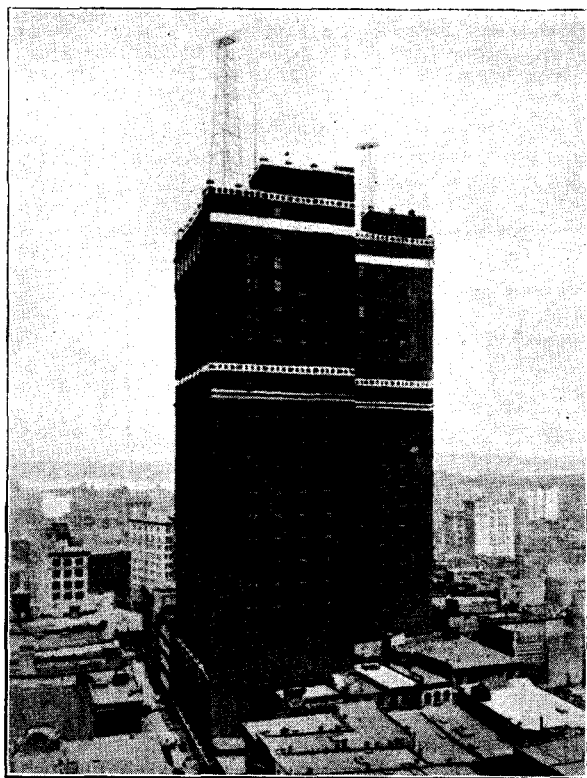


FIG. 4.—NEW YORK TRUNK EXCHANGE.

**HAPPY DAYS
Are Here Again!**

VACATION IN MICHIGAN

NOW IS THE TIME of year when people want to go places and do things—when they want to get away from the confinement of their daily jobs. You may still be scanning the travel booklets, but you are planning a vacation of some kind, certainly.

On your trip this year remember that, although you may be miles away, you can keep in close touch with home and business by Long Distance Telephone.

Anxiety sometimes mars the pleasure of a trip. If you only knew that those at home were well, or that affairs were running smoothly at the office, your mind would be at rest and your pleasure increased.

Wherever you go, you will see the Blue Bell sign along the way, indicating that a telephone is at hand. From any of those telephones, you can get in touch with home quickly and at small cost. Make it a point to call home every day or so while on your trip this summer.

MICHIGAN BELL TELEPHONE CO.

FIG. 5.—ADVERTISEMENT OF THE MICHIGAN BELL TELEPHONE CO.

The buildings themselves form notable additions to the architecture of each town. Fig. 4 shows the Walker Street Building, New York City, which houses the long distance exchange. It is being extended to 34 stories and to double present area.

A new trunk exchange in Detroit was brought into use while we were in the States, and the opening was attended by the two engineering members of the party, a fact which was duly noted by the Detroit Press, which announced next day that so great was the importance of the transfer, that Messrs. Jenkins and Thompson of the British Post Office had come specially from England to be present!

The normal furnishing and equipment of these buildings, even in parts to which the staff alone have access, conform to a very high standard.

We have now run briefly through a description of the type of long distance service given, the methods whereby the remarkable results are achieved, and of the plant and buildings provided, but there is one aspect of American long distance telephoning which must yet be mentioned—publicity. The American companies believe first and foremost in securing public goodwill—a "good press." With this in view they started a little over 20 years ago to advertise extensively. For the first 19 years these advertisements were wholly indirect in their appeal—that is they did not advocate that one should rent a telephone or make long distance calls, but were solely designed to stimulate interest in the telephone business in general, and to bring before the public a picture of a progressive, energetic, up-to-date public utility business, willing, anxious, and able to serve.

spirit, pervading the business from top to bottom, and its influence on the service is incalculable. It is embodied in the text of one of the most famous of the advertisements of the A. T. & T. Company, "Weavers of Speech."

"Upon the magic looms of the Bell System, tens of millions of telephone messages are daily woven into a marvellous fabric, representing the countless activities of a busy people.

Day and night invisible hands shift the shuttles to and fro, weaving the thoughts of men and women into a pattern which, if it could be seen as a tapestry, would tell a dramatic story of our business and social life.

In its warp and woof would mingle success and failure, triumph and tragedy, joy and sorrow, sentiment and shop-talk, heart emotions and million dollar deals.

The weavers are the 70,000 Bell operators. Out of sight of the subscribers, these weavers of speech sit silently at the switchboards, swiftly and skillfully interlacing the cords which guide the human voice over the country in all directions.

Whether a man wants his neighbour in town, or some one in a far-away State, whether the calls come one or ten a minute, the work of the operators is ever the same—making direct, instant communication everywhere possible.

This is Bell Service. Not only is it necessary to provide the facilities for the weaving of speech, but these facilities must be vitalised with the skill and intelligence which, in the Bell System, have made Universal Service the privilege of the millions." That is the Spirit of Long Distance Telephony in the United States of America.

LONG DISTANCE TELEPHONY.

J. F. DARBY (*Headquarters Traffic Section*).

(V.)

System of Operating.—(IV) *Trunk Operating on a Demand (American Combined Line and Recording) Basis.*—The principles of the C.L.R. method of working have already been indicated in these articles; it is now proposed to proceed with a more detailed description of the main features of the scheme.

It will be recalled that the basic feature is the provision of switchboard and line facilities to enable an operator to record a demand for a trunk call and to attempt to set up the call without releasing the subscriber.

At the outset it may be advantageous to give an outline of the trunking arrangements that would obtain in the case of a trunk centre with manual local exchanges in the local area. Fig. 1 shows, in skeleton, the arrangement which would be suitable for a centre such as, say, Liverpool. For simplicity, only one circuit is drawn for each class of circuit concerned; the local exchange is shown with (a) a multiple of subscribers' lines over A and B positions, in the normal manner, (b) the subscribers' calling signals associated

positions—the *demand* positions, (h) the termination of the incoming ends of the trunk circuits on an ancillary basis on the inward positions and (i) the repetition of the incoming terminations on the 'through' positions.

Five classes of positions are shown (although separate 'through' and tandem positions are not essential in all cases):—

- (i) *Demand* positions—on which trunk demands are received from subscribers connected with exchanges in the local area and from subscribers on minor exchanges for which the trunk exchange in question is the trunk centre. On these positions, attempts are made to set up the trunk connexions while holding the subscribers;
- (ii) *Delay* positions—on which attempts are made to complete calls which, in the first instance, cannot be completed on the demand positions;
- (iii) *Inward* positions—on which connexions are completed to the no-delay area of the terminal trunk exchange. (These positions may in some cases be used as combined inward and through positions, in which case the multiple of the trunk circuits is provided over these positions and no separate 'through' positions are provided);
- (iv) *Through* positions—on which connexions (controlled at other trunk centres) of a 'trunk circuit to trunk circuit' type are set up. (Normally if through positions are

TRUNK EXCH.

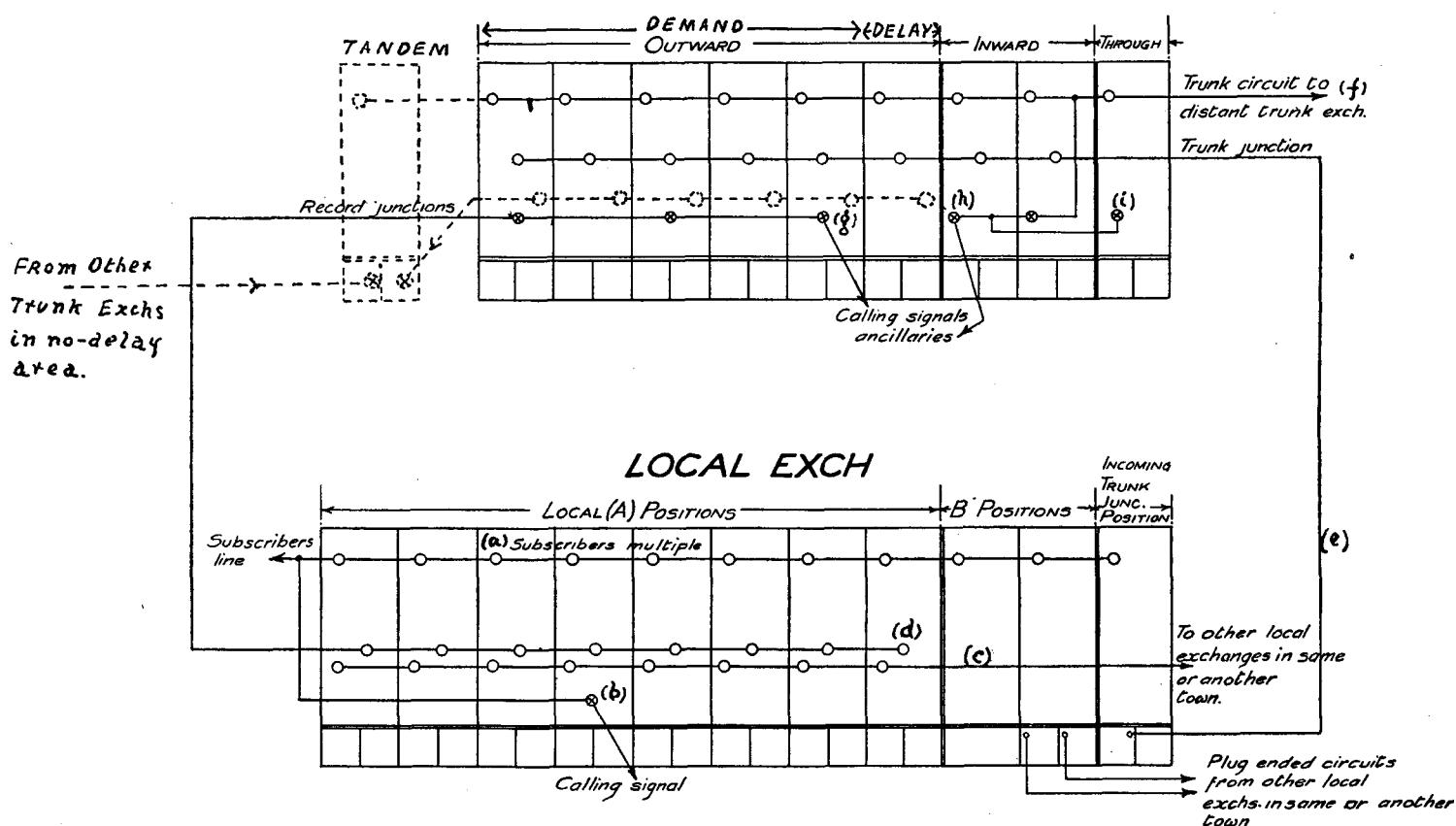


FIG. 1.

with the subscribers' multiple, (c) an outgoing multiple of junction circuits, (d) an outgoing multiple of record circuits to the trunk exchange and (e) incoming trunk junctions, the outgoing ends of which are multiplexed over the outward and inward positions of the trunk exchange.

As regards the trunk exchange, attention is directed to the following features: (f) the multiple of the trunk circuits over the outward, inward, through and tandem positions, (g) the termination of the record circuits on an ancillary basis on certain of the outward

provided, the trunk multiple is not provided over the inward positions);

- (v) *Tandem* positions—on which through connexions of a 'junction circuit to trunk circuit type' are normally set up.

In the case of the last-mentioned positions, indicated by the dotted outline in Fig. 1, the panel equipment consists, mainly, of a multiple of the outgoing ends of the trunk circuits. The circuits incoming to these positions may, according to circumstances,

consist of all or some of the following: (i) circuits from the outward positions of other trunk exchanges in the no-delay area of the trunk exchange in question, (ii) transfer circuits from outward positions in the same exchange, to meet cases where the panel capacity of the outward positions is insufficient to accommodate the whole of the trunk multiple, and (iii) junction circuits from local exchanges to meet cases where local exchanges are empowered to control certain long distance calls.

It is mentioned that, as far as possible, the trunk circuits are worked on a bothway basis with a view to obtain maximum circuit carrying capacity.

'clear' in the case of connexions to 'trunk records.' This reversal of the connexion has the effect, apart from a transmission aspect (a higher voltage than that given by the local exchange battery is brought into use):—

- (a) of providing through signalling from the subscriber's switch-hook to the demand position (answering supervisory lamp)—it will be recalled that the original connexion was set up via a local exchange A cord circuit and this precludes through signalling—and
- (b) of checking the record of the exchange number of the calling subscriber's line.

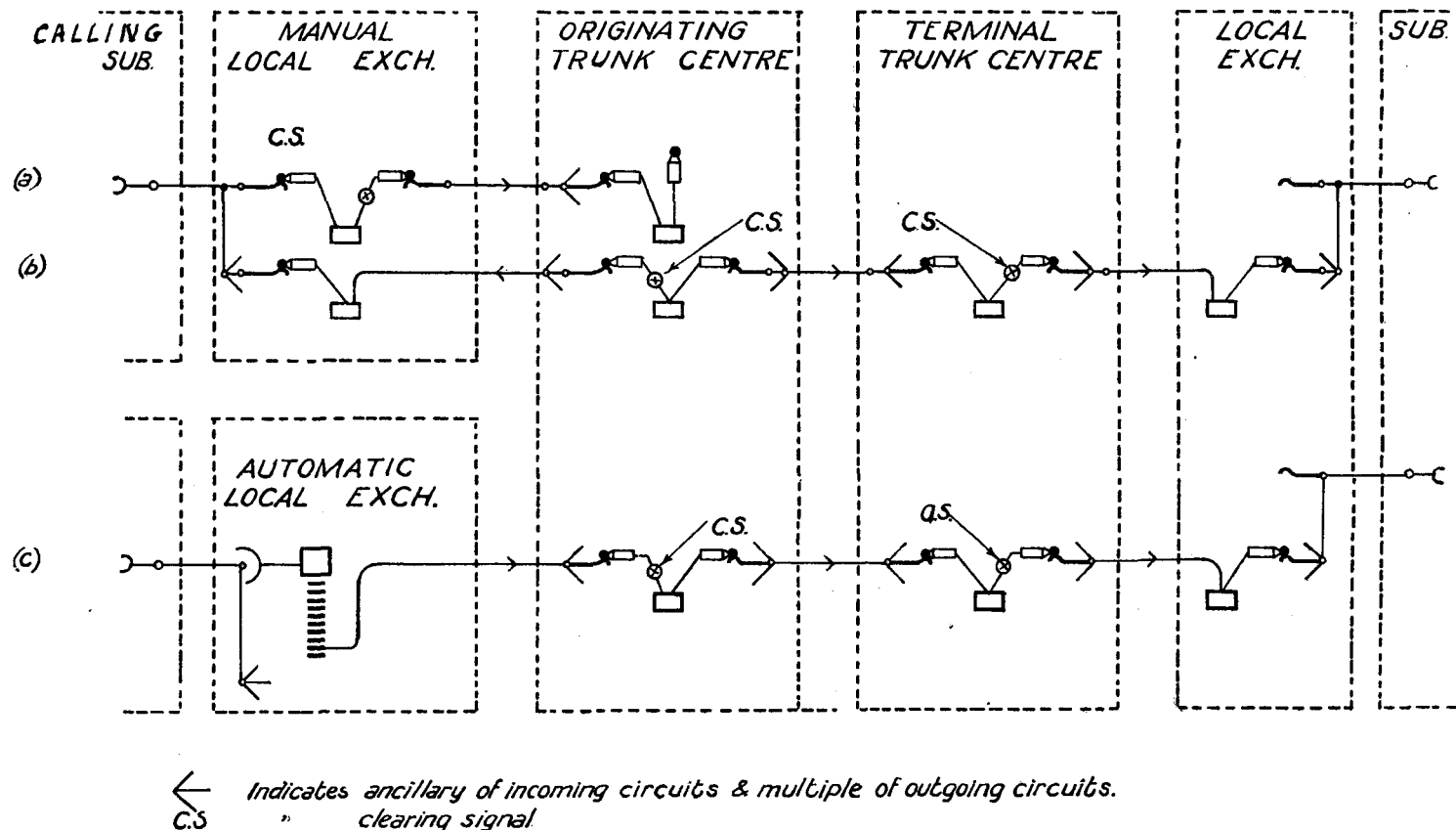


FIG. 2.

To proceed now with the method of operation—the subscriber on a *manual* system calls his local exchange and passes his demand for a long distance call (either by asking for 'long distance,' or by giving his demand in full to the A operator who passes the details forward to the trunk demand operator). He is then connected via a record circuit (of low transmission value) to a demand position in the trunk exchange (see Fig. 2, condition (a)).

The demand operator, using a second cord circuit, plugs into a disengaged circuit, if one is available, to the distant terminal trunk exchange (or intermediate switching exchange if the routing so requires) and, as an overlapping operation, reverses the connexion with the calling subscriber by making a second connexion to the local exchange over a trunk junction—asking the local operator for the number in question 'without,' e.g., '2468 without.' The local exchange B operator makes connexion to the number, disregarding the engaged test. Connexion with the calling subscriber is thus established by the second route (see Fig. 2, condition (b)) while he is listening on his telephone but without disturbance to him in any way.

The trunk demand operator then takes down the first connexion to the record circuit and thereby gives a clearing signal to the local A operator on the *calling* supervisory lamp. Local operators are instructed to disconnect on receipt of this single lamp

In the case of *automatic* exchanges, the subscriber is required to dial a special code for long distance calls and, by this operation, he is connected via automatic switches and a record circuit to a demand position. (A modification of this system will be dealt with later.) These record circuits differ from those in use at manual exchanges in that their transmission value is such that a trunk connexion can be set up over them without serious transmission loss; they are termed *recording and completing* junctions. When a connexion is set up from an 'automatic' subscriber to a demand position, the circuit conditions provide for normal through signalling from the subscriber's switch-hook to the demand position (supervisory lamp on the answering cord). In view of this signalling facility and the fact that the transmission aspect is satisfactory, such connexions are not reversed, as in the case of manual exchanges, but the chain of connexions is set up while holding the subscriber on the original recording and completing junction (see Fig. 2, condition (c)). It will, however, be observed that, so far, under this arrangement, no special verification has been made of the recorded number of the *calling* subscriber. Where such a check is considered to be necessary, facilities can be provided to accomplish this. The broad outline of the scheme, as far as the 'step by step' automatic system is concerned, is that the demand operator dials back over a 'checking' circuit to the originating automatic exchange, firstly, the number

of the recording circuit on which the subscriber is held and then the exchange number that the subscriber has quoted. A special tone is given back to the demand operator if the exchange number dialled corresponds to the exchange number of the line on which the calling subscriber is held. A check is, of course, always provided when the calls are reversed to subscribers (in case of calls which are ineffective initially or delayed), and it seems possible that partial verification of this nature may be sufficient in the British inland system without recourse to the full facilities outlined above.

The foregoing covers briefly the setting up of the connexion between the subscriber and the demand operator and the connexion with the trunk circuit can now be dealt with. Each demand operator is provided with a schedule of some kind, e.g., a bulletin sheet, visible index file or booklet, which indicates, for approximately 90% of the traffic handled, the routing applicable and gives, in addition to the normal route, the primary and secondary alternatives and other information, such as rates, the name of the distant terminal trunk centre, and when cord circuit repeaters are necessary. This information is provided with a view to enable demand operators, as far as possible, both to set up connexions and to answer enquiries without reference to a second operator. With the knowledge of the routing involved, the demand operator seeks a disengaged trunk line; the latter are equipped with visual signals to facilitate the selection of idle circuits. The result is, that, as soon as circuits become disengaged, they are picked up by 'waiting' operators. Alternative routing, providing authorised routes are used, is permitted at all times, with the result that although circuits are provided on a basis which does not admit of no-delay service, a high proportion of calls are set up while the subscriber is held and, in addition, a high percentage occupation of the circuits is obtained.

It is mentioned that the subscriber is not held for more than one minute, if delay is encountered owing to 'no circuit available' conditions. (Subscribers may, however, be held in certain cases up to 3 minutes.) Tickets in respect of calls which cannot be disposed of within 10 minutes on demand positions are passed to *delay* positions for completion. (During this period, although the subscriber is released, his line is held in order to facilitate completion of the call and to provide contact, if necessary, between the subscriber and the operator holding the ticket prepared for his call.)

The operation of delay positions is similar to that in force in the case of special control positions in Great Britain except that, unless there is serious delay, the trunk circuits are not withdrawn from the use of the demand operators. The positions are assigned for working to certain distant towns and for this reason are known in America as *point to point* positions. Connexions to trunk circuits are set up in the multiple and, when a large group of circuits is concerned, the operators controlling this group work in a team; the circuits are not divided amongst the individual operators.

As regards operating on incoming positions, the trunk circuits are terminated on jacks on an ancillary basis and connexions are set up in a manner similar to the operating on jack-ended B positions in Great Britain. Connexions to local subscribers are generally made by straightforward junction methods or direct keying.

Through positions are normally provided when the capacity of the panels over the inward positions is inadequate to accommodate both the multiple of the outgoing trunk circuits and the multiple of the local junction and no-delay trunk circuits. In such cases, the incoming trunk circuits are connected not only with inward positions but also with 'through' positions. When a distant exchange calls, the signal is first received on the inward positions, and the incoming operator, upon entering the circuit, learns that a 'through' connexion is required. By the operation of a key, either on the keyshelf or in the panel, the 'incoming' signal is transferred from the lamp on the incoming position to a lamp associated with the circuit in question on a 'through' position. Another method of transferring calls from incoming to 'through' positions is for the incoming position operator to request a 'through'

position operator to take up a connexion on a certain incoming circuit; the request is made over a local interposition junction.

Tandem positions are essentially through switching positions and normally accommodate incoming circuits operated on a straightforward junction (headset listening) basis. The panel equipment consists mainly of a multiple of the outgoing ends of trunk circuits.

It has been indicated above that tandem boards are used, in certain circumstances, to allow outward (demand and delay positions) operators at the same or remote trunk centre to obtain access to the trunk network. It will be recognised that these operators have not the same facilities for picking up idle trunk circuits as operators with the circuits multiplied immediately in front of them. To meet, to some extent, this disability, an *overflow* jack is provided at the beginning of each group of trunk circuits in the tandem multiple. When a tandem operator receives a demand for an exchange to which no circuits are available, she connects the line, on which the demand has been received, to the overflow jack of the group concerned. A distinctive tone is thereby given back to the operator requiring the circuit. As soon as a circuit in the group in question becomes free, the supervisory signal associated with the relative calling cord at the controlling exchange commences to flash, indicating to the operator concerned that she should make another application for the circuit required, as one of the group in question is, at that moment, free.

To meet cases where a tandem operator disconnects a line in error or forgets a demand after clearing her headset from the controlling operator, a *re-order* jack is provided; the connexion of a circuit to this jack gives back a flicker signal and distinctive tone to the controlling operator, indicating that a fresh demand should be made.

(To be continued.)

G.P.O. PLAYERS DRAMATIC SOCIETY.

WE regret that by a slip of the pen, in our review of "Cock Robin," Mr. Storr was referred to as "giving a capital rendering of the sullen lover who takes refuge in drink." The rôle (Richard Lane) was, of course, sustained by Mr. Laurence Gartland. Mr. Gerald Storr took the part of Julian Cleveland, who busies himself in conducting the informal enquiries into the murder, a part into which he put considerable individuality.

The annual general meeting of the Society will be held on April 14, when it is hoped that honorary members will attend in full force. The Society proposes to enlist the support of honorary members in a more active capacity.

The annual dinner and dance of the Society will be held on April 21. Honorary members will be advised of the place and time in due course.

SHEFFIELD DISTRICT NOTES.

MR. J. H. ANSTEE, Sheffield Exchange Superintendent, left us at the end of last month to take up duty at Newcastle-on-Tyne. Mr. Anstee, during his 7½ years stay was intimately connected with the Chesterfield and Sheffield Auto. transfers, and during the last four years had charge of the Sheffield Trunk and Auto. Manual exchanges. His arrival in Newcastle was nicely timed for a further auto. transfer.

He took with him various gifts, a camera from the District Manager's staff, a cigarette case from the Supervisors, a watch and gramophone records from the operating staff, and best wishes from his many friends in Sheffield.

He is succeeded as Exchange Superintendent by Mr. E. W. Cross.

We would extend a very cordial welcome to Mr. W. Knight from Leeds, who has taken over the post of H.C.O. vice Mr. Beams, transferred to Cardiff.

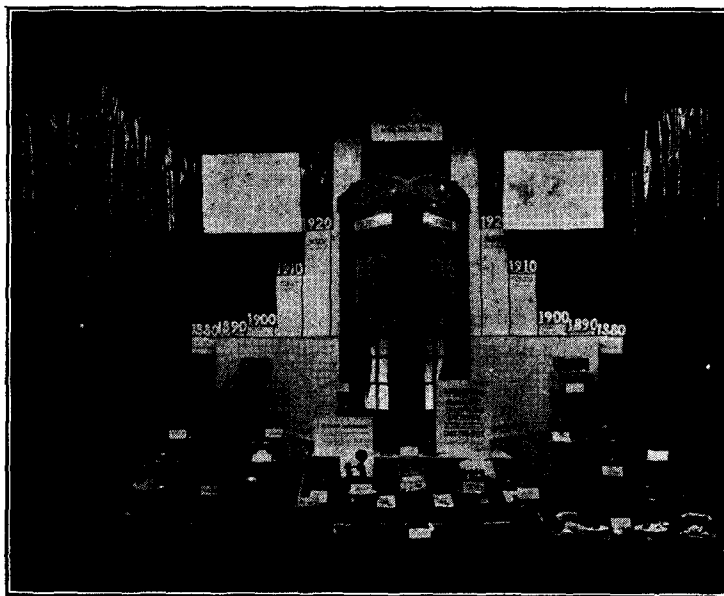
We hope to see Miss Dyson in her accustomed place in the near future and trust that the bracing air of Shoburness has fulfilled its intended purpose.

Marriage.—Miss I. M. Swinscoe, Miss V. Laverick and Miss E. Havenhand. Our best wishes on their retirement from the Service.

DISPLAY OF TELEPHONE APPARATUS AT MESSRS. SELFRIDGE & CO., LTD., OXFORD STREET, LONDON.

It was only possible to make a brief reference to this subject in the March issue of the *Journal*, but it is felt that readers of the *Journal* will be interested to learn more about what was a definite innovation.

Messrs. Selfridge & Co. have always taken a keen interest in telephone progress. They came to the conclusion that an exhibition of telephone apparatus with an historical interest would appeal to the public, and they were good enough to offer the London Telephone Service the use of one of their Oxford Street windows for the purpose. A photograph of the window accompanies this article.



The window exhibit was designed primarily to indicate the changes in the design of telephones from the type as invented by Dr. Graham Bell in 1876 to the present day, and for the purpose a model of Graham Bell's telephone was shown together with typical instruments used at 10-year stages, i.e. 1880, 1890, and so on up to 1930.

The present day telephone was represented by a hand microphone and, in addition, specimen hand microphones in various colours were displayed.

As a central attraction, Messrs. Selfridge provided a replica of a No. 2 kiosk, the windows of which were intermittently illuminated to display the shadowy form of a person engaged in telephoning.

Bold pillar diagrams flanking the kiosk illustrated the growth in the London system and other items of interest included:—

Large valves of the type used in transatlantic telephony contrasted with a valve used in a normal broadcast receiving set.

Maps showing the range of international telephone communications in 1920, and the extension achieved to date.

Typical automatic switching apparatus.

An amplifier as used by deaf persons.

An automatic dial telephone prepared for use by the blind.

Sections of typical telephone cables.

A display of parts used in making up a standard telephone instrument.

Special prominence was given to the Telephone Directory. Growth was illustrated by the display of a copy of a directory published in 1880 in association with a current directory.

A notice in the following terms was displayed by Messrs. Selfridge:—

"We have pleasure in dedicating this window to the London Telephone Service. Here we display results of the effort that is continuously being made to improve not only the instruments but the whole Telephone Service."

The display was in position from Feb. 15 to Feb. 21 and attracted much attention. A great deal of interest was displayed by the public and crowds of spectators were continuously in front of the window.

In addition to the window display, Messrs. Selfridge & Co. were kind enough to provide accommodation for an Automatic Demonstration Unit in a prominent position on the 3rd Floor of their Store for two weeks. Experienced demonstrators were in attendance to explain the details of automatic working, and a Contract Officer was available to answer enquiries about service and to negotiate agreements. Specimens of new posters were displayed and much advertising literature was distributed—including the kiosk folder, which evoked special interest.

It is interesting to note that nearly 5,000 people attended this demonstration on the third floor in the two weeks.

Following the Oxford Street display Messrs. Selfridge were good enough to arrange for further displays to be given later at Messrs. Barnes & Co., Ltd., of Finchley Road, N.W.3, and at Messrs. Quin & Axten's of Brixton Road, S.W.9. At each of these subsequent displays the public interest was steadily maintained.

There is no doubt that public interest has been greatly stimulated, and a better conception of the activities and value of the Telephone Service has been created by this exhibition.

These notes cannot be closed without an acknowledgment of the facilities given by Messrs. Selfridge & Co., Ltd., and the ready assistance and courtesy shown by all their staff in connexion with the display.

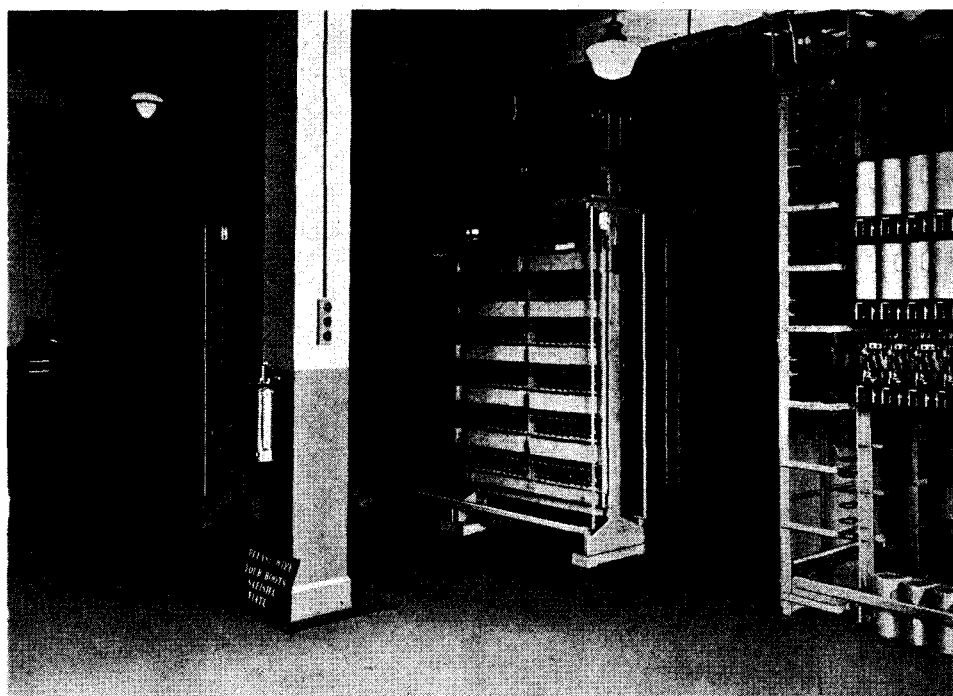
GEO. W. LIVERMORE,
District Contract Manager, West District, London.

THE LOWESTOFT FRONT, 1910 AND 1916.

By J. J. T.

OFFICIALLY the writer has twice visited the fishing town and port of Lowestoft. Upon how many other occasions matters not for the purpose of these reminiscences. It was in the summer of 1910 that I found myself the junior and least important member of an Anglo-German committee charged with the by no means unimportant task of examining the cause or causes of the indifferent working of the Anglo-German telegraph circuits in general, and the duplex circuits in particular. Two months were spent in investigating the troubles, the first four weeks by the bi-lingual committee on German territory, including consultations and experiments in Berlin, Bremen, Hamburg, &c., the repeater station at Emden and the cable hut on the island of Borkum. This was followed by similar consultations and researches by the same committee on English territory, which included the C.T.O., London, and the repeater offices of North Walsham and Lowestoft, after which a joint report was produced, illustrated by some scores of highly instructive oscillographs, taken at both the British and German coast station repeater offices. One's recollection of the united visit to Lowestoft repeater office on Lowestoft front, actually on the beach at the foot of one of the "scores," was that of a two-nation happy family out to do the best for international communication. Incidental to the visit to Borkum where our German colleagues showed us how they and their friends enjoyed themselves, we also at Lowestoft, with its jolly crowds of holiday-makers on cliff and beach and pier, were able, in our turn, to introduce those British men and women who at one time were presumed to take their pleasures sadly. Side by side with pleasure was the sight

and now—— NAIROBI



"From to-morrow Nairobi will have one of the most up-to-date telephone exchanges in the world. A new 1,000-line fully automatic exchange will then be cut over and more than 700 subscribers' lines and nearly 100 private branch exchanges will be transferred from the old magneto system. The whole of the automatic equipment together with all the private branch exchanges and subscribers' telephones has been manufactured by The General Electric Company, Limited, and the completed installation has the distinction of being the first of its kind in East Africa."

From *The East African Standard*, dated Jan. 27, 1931.

THE GENERAL ELECTRIC CO., LTD. TELEPHONE WORKS ——— COVENTRY.

TELEPHONE NO. 4111.

TELEGRAMS: SPRINGJACK, COVENTRY.

LONDON OFFICE: MAGNET HOUSE, KINGSWAY, W.C.2.

BRANCHES AND AGENCIES THROUGHOUT THE WORLD.

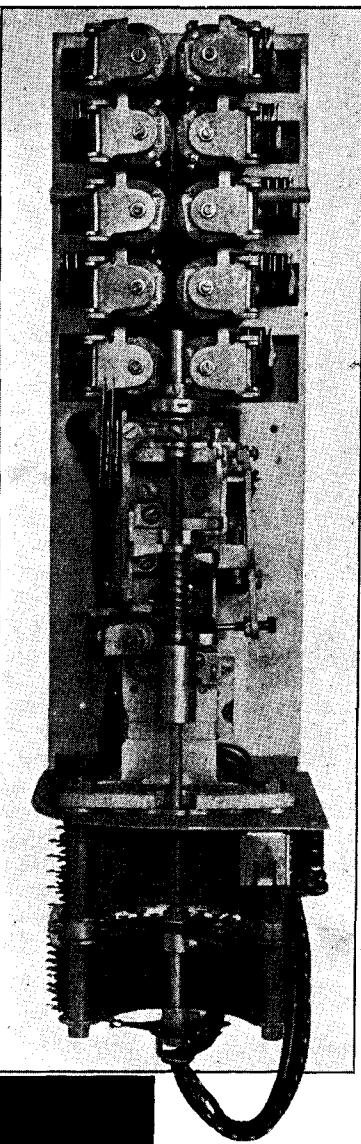
The Reverting Call Switch—Symbol of Strowger Ingenuity



BECAUSE of its basic simplicity, and because of the ingenuity of design which is the result of forty years' experience in automatic telephone manufacture, Strowger equipment performs many functions simply and easily which, under other methods of operation, are very often quite intricate and difficult of accomplishment.

The reverting call switch shown in the accompanying illustration offers a typical example of Strowger ingenuity, consisting as it does of combinations of standard Strowger parts. This means, reverting calls are handled in a simple manner, entirely automatically. To call a party on his own party-line, the caller merely dials a special listed number and hangs up his receiver. A bell will then be rung alternately with that of the called party until that party answers, which stops the ringing. The caller then picks up his receiver and converses as usual.

Due to its fundamental design, Strowger equipment performs all necessary functions in the simplest and most direct manner possible, and with a minimum of apparatus. The resulting advantages—economy, both of first cost and maintenance, and highly efficient and profitable operation—have been important factors in making Strowger the outstanding name in dial telephony throughout the world.



Automatic Electric Inc.

Manufacturers of

STROWGER AUTOMATIC DIAL TELEPHONE AND SIGNALING SYSTEMS

Factory and General Offices: 1033 West Van Buren Street, Chicago, U.S.A.

Sales and Service Offices in All Principal Cities

GENERAL EXPORT DISTRIBUTORS

The Automatic Electric Company, Ltd., Chicago

In Canada Independent Sales and Engineering Co., Ltd., Vancouver
In Australasia Automatic Telephones Ltd., Sydney
In Japan Automatic Telephones Ltd. of Japan, Tokyo
In China Automatic Telephones of China Federal Inc. U.S.A.

ASSOCIATED COMPANIES

American Electric Company, Inc. Chicago
 International Automatic Telephone Co., Ltd., London
 Automatic Telephone Manufacturing Co., Ltd., Liverpool
 The New Antwerp Telephone and Electrical Works Antwerp

75% of the world's automatic telephones are working on the Strowger system

STROWGER AUTOMATIC

THE PASSING OF "VIA INDO."

By J. J. T.

THE obsequies of an old and worthy friend, though saddening, are fortunately and not infrequently robbed of much of their sting by the remembrance of good work done, and the fact realised that a purpose has been accomplished by the steady, maybe unobserved performance of duties faithfully followed out.

Something in the nature of this atmosphere was created in one's mind by the announcement on Feb. 28 last that the London—Teheran line of the Indo-European Telegraph Company *cum* the Teheran—Karachi line of the Indo-European Telegraph Department (India Office), had that day ceased to function. Sir Arnold Wilson, writing in the *London Times* two days later, gives the cause of this decision in general terms as follows:—"The development of wireless communication between Great Britain and India, and in Iraq and the Persian Gulf, has now deprived the Persian land lines of much of their former international importance," though it is understood that the Persian Gulf cables from Fao to Karachi, and certain wireless stations will be taken over by the British Imperial & International Communication Company. The first Persian Gulf cable was laid in 1864.

The total length of the line was six thousand miles and was composed of open overhead lines and underground lines; ocean, deep sea, shallow-water, and mud-bank cables, travelling through the geological variations of Great Britain, Germany, Poland, Russia, and Persia to the head of the Persian Gulf at Fao, thence to Bushire, Jask and Karachi.

Although this remarkable circuit, which at times was capable of being worked direct between the two extreme termini, was in the first place erected as a stand-by and reserve against the interruption of the long distance ocean cables to the East, by the irony of circumstances which no telegraph engineer of that period could have foreseen, this alternative route to India failed practically before a shot was fired in 1914. On or even before August, 1914, this communication was most certainly cut in more than one or two places along its route, and quite early in hostilities the Bushire—Teheran line fell into enemy hands. So far as a channel for the transmission of confidential State telegrams to British dependencies is concerned, it could never have been considered a satisfactory route, tapped as it was by no less than ten automatic relay stations between London and Teheran, while some lengthy portions of the circuit passed through isolated and uninhabited territory. As a route for the commercial world there is, however, also no doubt that "Via Indo" was a standard of accuracy and promptitude for the London, Manchester, and Liverpool merchants who had dealings in the East and Middle East.

In 1903 direct Wheatstone working was introduced between London and Teheran, which was subsequently extended across England to Liverpool and Manchester, a total distance very little short of four thousand miles. A special switching and prefix arrangement made it possible for the traffic to the two provincial stations to be switched through direct, while traffic for London by similar means was "trapped" and disposed of by the London operator.

The restoration of the European lines after the war, eastward of German territory, proved a very difficult task as regards the scarcity of materials, the inadequacy of transport, human or mechanical, and only a lengthy account by one of the Indo company's own engineers could adequately describe the situation.

Even so, the glory has now departed!

SOUTH WALES NOTES.

Mr. W. H. CROOK, Higher Clerical Officer, in the Accounts Section of the District Manager's Office, Cardiff, retired from the service on Jan. 25, upon reaching the age of 60. There are few officers in the Telephone Service who have had such a long career, extending almost over a period of 46 years.

Mr. Crook entered the service of the Western Counties and South Wales Telephone Co., at Bristol, in April, 1885, at a time when telephones were very little known. This company was absorbed by the National Telephone Co., about 1892. Mr. Crook was promoted to a Chief Clerkship and transferred to the Gloucester District in 1900 and, again, to a similar position at the Swansea office in 1905. In 1925 the Swansea and Cardiff districts were amalgamated and Mr. Crook was appointed as a Higher Clerical Officer in the combined district.

He was presented with an all-electric wireless set at a dinner held on Jan. 26 at Barry's Hotel, at which a large number of the staff attended, several of our former colleagues being present.

Mr. A. E. Ball (Chief Clerk) presided, and Mr. B. Waite (District Manager) made the presentation.

On behalf of the ex-Swansea staff, Miss Tremewan (District Office) presented Mrs. Crook with a cut-glass bowl.

The musical programme was in the hands of Miss E. G. Morgan (District Office), and she, together with Miss Purnell, Mr. Hughes, Mr. Taylor, and Mr. Thomas, contributed.

To wish Mr. D. B. HEBENTON, Assistant Traffic Superintendent, au revoir and God-speed on the occasion of his promotion to the position of Traffic Superintendent, Class II, Manchester, a representative gathering met for supper at the Philharmonic Restaurant, Cardiff, on Jan. 15. Mrs. Heberton was also present and a most enjoyable evening was spent. Mr. B. Waite (District Manager), after testifying to the sterling qualities and thoroughness of Mr. Heberton and how he had become endeared to the staff generally during his 16 years in the district, made a presentation of a 4-valve wireless set on behalf of the Traffic, Accounts and Contract Sections, District Manager's Office, also the operating staff, Cardiff Exchange.

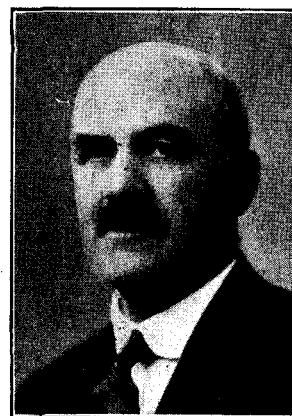
After Mr. MacDonald, Traffic Superintendent, Class II, had spoken, Miss Spearing, Supervisor, Cardiff Exchange, presented Mrs. Heberton with a cut-glass flower vase.

The meeting was presided over by Mr. R. S. Grosvenor, Traffic Superintendent, Class I. Community singing was very much enjoyed and songs were rendered during the course of the evening by Miss N. P. Grosvenor, Mr. A. W. Trethewy and the Chairman.

RETIREMENT OF MR. W. H. KING.

A WELL represented gathering of the N.W. Telephone District H.Q. Staff, assembled in the Contract Office to pay their official farewell to Mr. W. H. King, Contract Officer, Class II, of Blackpool, who retired on Dec. 31, 1930.

Mr. J. K. Murray (District Manager), who presided, referred in the course of his speech to the high appreciation of his services. The presentation,



which consisted of a grandmother clock, was made by Mr. J. E. Greaves (Contract Manager), who gave some interesting information on the growth of subscribers in the Blackpool area during the post-war period of Mr. King's activities on the Fylde Coast. A further tribute to the regard and esteem in which Mr. King was held by all members of the staff formed the theme of a few remarks made by Mr. T. W. Gregory, Contract Officer, Class I. In his reply Mr. King entertained the gathering with some interesting reminiscences, which covered a period of his old N.T.C. days, and thanked all the staff for their good wishes in his retirement. Later, farewell greetings closed an interesting evening at the George Hotel.

of the fishing fleet in and out of the harbour, and down on the beach herring boxes stamped with "Altona," &c., to remind our co-committeemen of their own seaboard.

Little more than five years afterwards it was with something in the nature of a touch of irony that quite a different mission formed part of my duty. With less than an hour's notice, with a selected staff of a dozen telegraphists, we took train from Liverpool Street Station, following on one of the worst gales and snow storms which have ever visited London and the East Coast. Not a single telegraph pole was upstanding for miles at a time. Some had been uprooted and others had in addition been re-planted upside down in the earth. Hand signalling was necessary at many places along the line and when our train, after creeping a considerable part of the way, reached Lowestoft, including one lengthy stop, the engine chimney was festooned with scraps of telegraph wire it had caught up *en route*.

We found our way in the darkness to the repeater office on the sandy beach. How changed since 1910! Protected now by wire-netting, corrugated iron sheeting and an armed guard with dug-out all complete, it was unrecognisable from the outside as I had known it. Our little company swarmed into the tiny building which was never intended to accommodate more than three or four officers, but were heartily welcomed by the officer in charge, Mr. Sorrell, long since retired. As there was no prospect of the restoration of communication with London for some days the plan was to work practically from the cable-head to the Dutch offices, and with this in view, Hughes apparatus straight from the factory had accompanied us on our journey. The communication by the one Dutch cable that worked direct into the Lowestoft repeater office was broken in the sea section, while the land lines along the small strip of coast line to the remaining Anglo-Dutch cable were also down. Hence, for the moment the situation was little better than when in London. Lowestoft Front was a desolation, with its smashed windows and deserted hotels and boarding-houses! One engineer had accompanied us and there was one local lineman. It was now pitch dark and local advice was so emphatic concerning the risk of being shot by our own sentries if an attempt to restore the line until dawn were made, that nothing could be done in that direction for a few hours. No mechanic could at the moment when we left London be spared, but thanks to the technical knowledge of many of the staff no time was lost, all hands assisting in unpacking and re-assembling. As most of the apparatus was new, it was just as well that the lines were interrupted. As it happened, all but one Hughes proved workable by the time the first circuit was through to Amsterdam, and the wheels of that one simply refused to move, made up as it was from rejected pieces from its working brothers. A mechanic arrived, and also additional staff about 24 hours later. For six days and nights the circuits were worked literally without a stop, the traffic very largely code, as Holland was practically the chief neutral country. There was no telegraph or telephone line between London and Lowestoft for this period owing to the difficulty of transport and the sparsity of the necessary material itself this side of the North Sea. The telegrams were therefore conveyed, by special adult messengers, in locked despatch cases, one key being held by the Superintendent in London and the other by myself. Owing to the stoppages on the railway line trains were hours behind and it so happened that nearly twenty hours had expired before news reached London that our little party had reached its destination. Not even in 1916 had it been realised that wireless telegraphy had its dangers in time of war, and so someone was led to send a radiogram via Caister wireless station to my humble self as to what I was doing. I do not know, but I have always suspected, that the fact of Zeppelin raids over the district upon each of those six nights that our little band was engaged in that interesting job on the sands, was not unconnected with that all too friendly enquiry after our welfare from headquarters. Certainly things were decidedly lively during those lovely moonlight nights spent on Lowestoft Front during the War 1914-18.

Never, I should say, have telegraphists worked as those colleagues of mine on Lowestoft beach, once they were assured that, figuratively speaking, the Rule Book had been destroyed by

an Act of Providence! Did one of their number require a shave—a run up the "scores" to the nearest barber and back in ten minutes was the limit and it was done. There was no accommodation for the "Finished" telegrams which had to be retained and guarded till our return, neither was there any means of requisitioning such ordinary articles as tables. Just a word to the wise ones, then a scrounge round on the beach by these stalwarts and a few "Altona" herring boxes were soon dragged into the office, dried by a roaring fire, and rapidly sawn and hammered into quite efficient "examining" and "service" tables. Did the staff smoke on duty? Well, I ask you!

REVIEWS.

"*Electric Clocks.*" By F. Hope-Jones, M.I.E.E., F.R.A.S. Published by the N.A.G. Press, Limited. xv + 261 pp. Price 12s. 6d. net.

The recent achievements of the wonderful Shortt Synchronome Free Pendulum clocks at Greenwich and other observatories have roused general interest in the subject of electric time-keepers. The use of electricity for controlling clocks dates back, however, to the year 1840. Since the first crude attempt made in that year to construct an electric clock, 800 patents on the subject have been published, but only very few of the designs embodied in these patents have proved of real utility in practice. In the book under review Mr. Hope-Jones, the head of the firm which has produced the Free Pendulum clocks mentioned above, traces out the history of the development of electrically controlled clocks, and describes in great detail the various systems which have been evolved, including the latest Free Pendulum Synchronome clocks designed for general use, and which in time-keeping ability are almost the equal of the observatory type. It is written in his usual breezy style, and is very fully illustrated with clearly drawn and excellently reproduced diagrams. No special technical knowledge is required from the reader, and the paths of the non-electrical clock maker and of the non-horological electrician are smoothed by the inclusion of a glossary of simple electrical terms for the former and of simple horological terms for the latter.

It is a book which should be on the shelves of everyone who is in any way concerned with the installation and maintenance of electric clocks.

"*A Tribute to Michael Faraday.*" By Rollo Appleyard. Published by Constable & Co., Ltd. xiii + 204 pp. Price 7s. 6d. net.

In the autumn of this year there will be celebrated in London the centenary of the epoch-making discovery by Faraday of the production of electric currents by induction from a magnet.

In view of the interest in Faraday's life and work which has accordingly been aroused the appearance of the book under review will be welcomed. The author has not merely gathered information from the published works on the subject, but has personally carried out researches at Clapham in Yorkshire, the original home of the Faraday family, and also in the districts in London where they subsequently lived, and the results of this work, together with photographs taken by the author, are included in the book.

The account is given of Faraday's early life as a newspaper boy, his entry into the Royal Institution as a laboratory assistant and his subsequent rise there to the supreme position which he gained among the scientific men of his day.

The ideas of Faraday were later on developed by Clerk Maxwell, and through him have led directly to our present-day Wireless Telegraphy. In order to complete his account, the author accordingly briefly refers to Maxwell's contribution to the subject.

The book is well got up with excellent illustrations and should be welcomed by all, professional men and general public alike, who wish to know more about the great man and his work.

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

IV.

WHAT facilities are provided by the main and intermediate distribution frames at a manual telephone exchange?

A prize of a book will be awarded for the best answer, which should reach the Editor by April 30. The correct solution will appear in the June issue.

SOLUTION OF QUESTION II.

In general, the standard of the answers submitted for the February competition was very good, although one or two competitors wrote about "alternating current" flowing in the primary circuit of a local battery telephone! The answer submitted by Mr. W. A. Sallis, BM/BS4S, London, W.C.1, has been chosen as the best, though the final choice was a very difficult matter. His answer is concise and to the point, though unaccompanied by illustrative sketches, and is here reproduced *in toto*.

"In the 'solid back' transmitter, a circular carbon block, or electrode, is contained within a small brass capsule and is rigidly connected to the centre of a circular diaphragm, which is secured about its periphery. The capsule is fixed to the body of the transmitter and contains a fixed carbon electrode, the space between the two carbon surfaces being partially filled with hard carbon granules.

"Sound waves set up by the vocal cords, or by other objects in a state of vibration, and consisting of alternate compression and rarefaction of the air, impinge upon the diaphragm. An oscillatory movement, corresponding in frequency to the sound produced, is thus imparted to the electrode fixed to the diaphragm.

"A source of uni-directional electrical supply is utilised to cause a flow of current through one winding of an induction coil and included in the circuit is the capsule, current flowing between the electrodes due to the conductive state of the granules. Movement of the electrode attached to the diaphragm causes variation of the current flowing, on account of the changing formation of the granules; thus, a fluctuating current passes through the coil, corresponding faithfully to the variation and intensity of the sound waves.

"The second winding of the induction coil is affected by the transmitter circuit in that every difference of current value creates a variation of magnetic flux and the changing lines of force, in cutting the secondary turns of the coil, induce an alternating current in the winding, the ends of which are connected to the line and thence to the receiver.

"In the receiver, a U-shaped permanent magnet has a small coil of insulated wire arranged upon each limb. The two coils are so connected together with regard to the direction of winding that if the free end of each coil be connected to a battery, the effect will be to weaken or strengthen the mutual attraction between each limb, according to the direction of the flow of current. Presented to the limbs of the magnet and in a plane at right angles to their length is a light ferro-metallic diaphragm. The edge of the diaphragm is securely clamped and it is positioned to give a clearance of about 10 mils between itself and the pole pieces, which are extensions of each limb. The diaphragm is therefore attracted to, but does not touch, the magnet.

If, now, an alternating current be passed through the coils, the position of the diaphragm varies with the changes in magnetic attraction. Thus, if a sinusoidal current be passed through the coils the diaphragm vibrates at a frequency corresponding to that of the current. The resulting effect upon the atmosphere is the setting up of sound waves, the sound or note heard having the same frequency as the alternating current passing through the coils."

CANVASSING-DE-LUXE.

By A. C. ORCHIN.

PILLARED halls, ornate furnishings, pile carpets, smartly uniformed attendants, well-groomed salesmen, together with the usual cosmopolitan crowd of shoppers that throng our twentieth century super-stores—such is the atmosphere in which our fortnight's "canvassing-de-luxe" was carried out.

From a telephone publicity point of view the scheme presented many novel and interesting features and provided much speculative food for thought. The site of the stand was an excellent one, placed as it was between two gangways, thus being in the centre-stream of shoppers passing from one department to another.

The predominant feature of the exhibition was undoubtedly the fact of bringing a complete working automatic exchange and bureau of information, if I may describe it as such, face to face with a vast number of people, not in any way localised or confined to one particular class but truly representative of all classes of subscriber and non-subscriber, both metropolitan and provincial. The conspicuous nature of the interesting "window" exhibit, as events proved, brought many people into the store to the exhibition proper, where they were confronted by the formidable and impressive array of apparatus that constitutes our modern "automatic telephone system," in charge of expert demonstrators. It would appear from the interest displayed that the public at large have but a small conception of the ingenious apparatus and the multiplicity of mechanical operations that are brought into play by the simple act of dialling.

From the foregoing brief description it will be seen that the whole presented a wonderful field for intensive propaganda and direct canvass. The enquiries received were multitudinous and varied in type, ranging from "As to how many wires go to the dial?" to "Can you get me through to Muddelcombe-cum-Muddlecombe on this exchange, please?" The fact that these enquiries were made, however, although in some cases of a frivolous nature, portrayed a certain amount of interest, and once interest had been aroused, however slight that interest might have been, good opportunity existed to steer matters in the desired direction. The Englishman is proverbially a reticent soul and naturally averse to any direct "touting" policy, whether it be for tailor or telephone, hence the provision of the automatic demonstration provided not only an exhibition of extreme interest to the individual, but an easy means of approach with the main object in view of promoting interest in new and or additional apparatus.

In these days of subtle salesmanship this is a point of considerable importance, and might be well compared to the commercial principle on which this particular store has achieved so great a measure of success. Furthermore, it places both parties on neutral ground without subjecting either one or the other to the disadvantage of a strange environment.

Many interesting types of person were interviewed—from the hardheaded old Yorkshireman (reminiscent of an earlier age) who would have now to do with "these devilish machines" to the "Rhapsody in Blue" enquiring as to when pink "tele." cords would be available, to match the colour scheme in milady's boudoir.

Many and varied, too, were the queries as to what happened beyond the dial, particularly as to the metering of calls. Needless to say, the simplicity of the system, as demonstrated under working conditions, dispelled any doubts as to its accuracy.

In looking at the exhibition in retrospect, it is felt that a great deal of good has been done in educating the public up to the telephone, and that much useful seed has been sown which will fructify at a later date.

We might well adopt those two words "Going up," so much used by the lift attendants at this store, as our slogan for the 1931 sales programme.

TELEGRAPHIC MEMORABILIA.

Retirements.—To Messrs. C. E. J. Ford, J. Kench, J. Prout, and W. Tear, all of the Cable Room, C.T.O., sincerest wishes for a long and healthy pension time!

Obituaries.—All those to whom the name of "Slingo" has been a household word, and a happy memory of student and class days under the specially effective C.T.O. teacher of that name, will tender their sincerest and united sympathy to Sir William upon the especially sad death of Lady Slingo (*née* Miss Clara B. Haines of the Met.), and to whom our former and much beloved Technical Master was married in 1883. We have also to record the passing over of Mr. Philip Garrood, who entered the C.T.O. in 1879, and passing through the various supervising stages was made full superintendent in 1919 and retired in 1921. It is regrettable to add that Mr. Garrood went into the North Middlesex Hospital for surgical treatment, but heart failure supervened, in his 71st year.

Also on Mar. 1 last there passed away, in his 74th year, the very much respected Asst. Supt., Mr. A. J. Harris ("Scotty"), yet another member of the fast disappearing staff of the old Submarine Telegraph Company.

Yet another break with the past is that recorded by the demise of Mr. J. E. Faunch at his residence near Wadsbridge on Mar. 17. For some years the health of Mr. Faunch had been unsatisfactory, a fact which occasioned his premature retirement from the Telegraph Service. Mr. J. E. Faunch was the youngest of a quintette of that family then serving, and for many years afterwards in the C.T.O.

Companies.—*Telegraph & Construction Co., Ltd.*—Final dividend of 5%, making 7½% for year (against 10%) tax free. *American Telephone & Telegraph Co.*—Net earnings for 1930 were \$267,874,000, a decrease of \$8,000,000. *Marconi International Marine Communication Ltd.*—A final dividend of 10% less tax, making 15% for year. *British Insulated Cables Ltd.*—Final dividend on ordinary shares 10%, making 15%. Placed to depreciation and reserves £220,000, carried forward £279,000. *Cables & Wireless Ltd.*—Dividend of 5½ Cumulative Pref. Stock for half-year ended Dec. 31.

Countries.—*ABYSSINIA.*—The Government, says Reuter's Agency, is having wireless stations erected at Addis Abeba, and the work of construction is under the supervision of an Italian engineer. *ARCTIC REGIONS.* *The Electrical Review* directs attention to an error by which Bodö (Norway) was stated to be the most northerly broadcasting station in Europe, whereas it appears that a 0.5-kw. transmitter has actually been working regularly for over two years at Tromsö, Finnmarken, a station seven hundred miles nearer the North Pole than Bodö. The station has its own studio and also relays the Oslo programme. *AUSTRALIA.*—The P.M.G. announces that £70,000, the balance of the Postal Department's share of listeners' licence fees, after all charges to date have been paid has been diverted to general revenue, the financial depression having caused a drastic curtailment of the schemes proposed eighteen months ago. Listeners' fees were to have paid for 16 new relay stations. Of these 12 have now been postponed indefinitely. *BELGIUM.*—The London *Daily Telegraph* recently announced that, "a committee to investigate means of dealing with the problems of wireless transmission and the difficulties arising from overlapping of wavelengths has been appointed by the Belgian Minister of Posts and Telegraphs." It is interesting to call to mind the fact of the passing by the Belgian Parliament in June last of the new law concerning broadcasting, and established on Feb. 1 last, what is now known as the National Broadcasting Institute, when its first transmission was made through the Velthem station. The power used is 15 kilowatts on wavelengths of 508.8 metres in the French language and 333.5 metres in Flemish. The Institute, it will also be recalled, is under the control of a managing

committee headed by the Minister of Posts and Telegraphs, under State control. All persons possessing a listening set must pay a fee of 60 francs per year.

CANADA.—According to a communication through Reuter's agency, the present radio situation as between Canada and the United States is described as unsatisfactory. Canada has only 70 stations with a power of 33,000 watts and an assured range of 266,000 square miles, while the United States has over 660 stations reaching Canada with a total power of 679,000 watts and a range of 736,000 square miles. "Of 96 broadcasting stations in North America, Canada is only allocated six wavelengths exclusively," says another authority, and shares the wavelengths of six others. There is also constant interference with the latter, and the chaos has been aggravated by the licensing during 1930 of 16 high-powered stations in Mexico which use wavelengths allocated to Canada. The recently formed National Canadian Radio League, about two months ago, sent a delegation to the Canadian Minister of Marine and impressed upon him the desirability of the establishment of a national company to be administered by a voluntary directorate which would own and operate six powerful stations reaching every section of the Dominion, and thus neutralise to some extent, says *The Times*, the virtual monopoly enjoyed by numerous high-powered stations in the United States. The Minister of Marine had previously announced, according to *World Radio*, that no more stations will be allowed to be opened or extended, and no new licences will be granted, till legislation has been introduced during the next session of Parliament. Applications for licences have been so numerous that the Government may be compelled to enforce legislation, while even "a treaty with the U.S.A. is tentatively talked of." Another complication would appear to be the very solid fact that the Quebec Provincial Government contest the claim of the Federal Government to the exclusive right to control the broadcasting service, and the question is to come before the courts. In this situation it is certain that nothing is likely to be done during the present year—probably longer. *CZECHOSLOVAKIA.*—By the time these lines reach our readers, the first test transmission will possibly have been made from the new Brno transmitter, and by some time next month the new high-power Cesky Brod station will begin experimental transmissions. Brno's aerial power has been increased to 36 kw. but will continue to use its present wavelength of 341.7 metres. Cesky Brod, which will have an aerial power of 60-120 kw., will take over Prague's present wavelength of 487 metres, and Prague will use Czecho-Slovakia's shortest wavelength of 249.6 metres, i.e. 1,202 kc. *DENMARK.*—According to a decision of the Minister of Public Works, listeners are to pay a licence fee of 10 kroner (about 11s.) for the financial year ended March, 1932. Licences issued during the period Dec. 15, 1931 to Mar. 31, 1932, will be reduced to 5 kroner for the remainder of the financial year. It appears that many listeners who do not use their sets in the summer and autumn have been inclined to postpone payment of their licences till the moment when the reduced fee came into operation, and it has therefore been decided that the reduced fee is applicable to genuinely new listeners only. Danish licences in 1930 reached a total of 429,333 including 9,400 free to the blind, cripples, and to chronic invalids. Denmark has now reached the 12.1 licences per hundred inhabitants. In Denmark there are about 800,000 families, and 53.7% of these have receiving sets, probably the highest percentage in the world, says *The Electrical Review*.

EGYPT.—It is understood that the Marconi Company of Egypt has been granted a concession to establish radio-telephony between Egypt and other countries, including Great Britain. *FRANCE.*—Boat trains on the Paris-Havre and Paris-Cherbourg railways are now equipped with wireless receiving apparatus, which comprises a seven-valve set and earphones, which are hired by passengers for five francs and can be plugged into sockets in all compartments. Reception, according to *The Electrician* is good, though the jolting of the wheels over rail joints are somewhat distracting, and there is some fading out in tunnels. It is reported, says *The Electrical Review*, that the Minister of Public Works has

appointed a special commission to study the subject of electrical interference with radio reception and to suggest means of preventing its occurrence. It is hoped, says the same authority, that the French Broadcasting Bill will become an accomplished fact very soon. An addition was recently made by the inclusion of a seventh section covering radio diffusion. *World Radio* adds that the Minister for P.T.T. has requested the President of the Commission of Public Works, charged with the examination of the proposed Bill, to hasten the presentation of his report. A further Commission, under General Ferrie, has been appointed to indicate the most favourable positions for the erection of stations, with comments on the most suitable wavelengths and the maximum powers that could be profitably utilised. "The Bill may be ready some time between May and July," is the final word of a French optimist!

GERMANY.—A new submarine cable, 75 miles long, has recently been laid between Zarenzin, Germany, and Kampinge, Sweden. Manufactured by the Felten and Juilleaume Co., it is provided with loading coils, is paper insulated, and lead-sheathed. No less than 42 conversations can be carried on simultaneously, or 84 by means of carrier currents.

GREAT BRITAIN.—*Teleprinter.*—The first teleprinter exchange in Europe is in course of erection in the General Post and Telegraph Office, London. It is hoped that as many as one thousand lines will be at work before the end of the year. Subscribers will be charged an inclusive annual rental of about £90 for the installation of the apparatus—both receiver and transmitter—for private lines, for maintenance and for an unlimited service. The caller will dial the subscriber required in the usual way. *Telegraph Service Finance.*—The Commercial accounts of the Post Office for the year ended Mar. 31, 1930, show that the revenue increased 3.41%, while expenditure decreased by 2.24%. *Broadcasting.*—During 1930, 3,501,007 licences were issued, an increase of half a million in twelve months, excluding 19,942 issued to the blind. Presuming four listeners per licence as the average, there were thus 14 million listeners in the British Isles, an increase of two millions during the year. *Printing Telegraphy and the London Police.*—The Creed Printing Telegraph apparatus is at present on trial for use at the Headquarters, Scotland Yard, and also at certain sub-stations in the metropolis. *Improvements* in the organisation of the I. & I. Communications Co., and plans for perfecting the centralisation of its telegraph traffic in London are now in hand, according to well authenticated reports. *A new main cable* from Liverpool to Manchester—or should we say from Manchester to Liverpool?—contains special screened conductors for the B.B. Corporation. **HOLLAND.**—Broadcasting licences are not issued in Holland, but the law requires that receiver owners must register at their local post offices. On Jan. 1 last the number of privately-owned sets was 253,527, and in addition 173,703 having extensions from sets owned collectively were also registered. The percentage of listeners was about 55 per 1,000 of the population.

INDIA.—On Feb. 28 last the 6,000 miles telegraph line between London and Teheran closed down. The line opened in January, 1870.

ITALY.—The National Broadcasting Committee has decided to construct new stations at Florence and Bari. The power of the existing stations at Milan and Genoa will be increased from 8 and 7 to 60 and 10 kilowatts. **NEW ZEALAND.**—The Auckland, Christchurch, and Dunedin transmitters, which are now owned by the Radio Broadcasting Co., will be taken over by the Government in 1932. It is proposed that these three transmitters shall increase their power to 2,000 watts and that eight subsidiary 500-watt stations shall be erected in other towns, so that there will be a chain of Government stations throughout the Dominion. The smaller stations will be for relay purposes, mainly. *World Radio* says that the "privately-owned" stations will not be done away with, but they will be required to reach a higher standard. The proposals have not yet been ratified by Parliament. **NORWAY.**—The department of Commerce, in conjunction with the Director of Telegraphs has drawn up a new plan, according to *World-Radio*, for the reorganisation of the Norwegian broadcasting service on

the basis of one-programmes-association only for the whole of Norway, owned by the Press organisations, and another company (owned by the State) for the technical operation of all the existing stations, and the further development to provide for the ultimate operation of 41 stations that should make crystal reception possible for 90% of the population. The plan is to be submitted to the Storting shortly. **PHILIPPINE ISLANDS.**—The Governor-General will shortly invite tenders for the operation and maintenance of the nine principal radio stations now worked by the administration. Operated under a co-ordinated system the stations are expected to prove of great commercial value to the islands. Leasing to private organisations appears to be favoured according to Reuter's Manila Agency, but the creation of a semi-government entity is proposed as an alternative, to take over the control of the communication services. **RUSSIA.**—The Soviet Government is to construct six new stations to serve the Far East, says *The Electrical Review*. Some are to be completed this and some next year. They will be sufficiently strong to be heard in India and Africa. Direct wireless telegraph communication has recently been established between Soviet Russia and the United States of America. **SCOTLAND.**—The s.s. *Glengby*, in Oban Bay, took on board about a mile of cable to replace the existing cable between Mull and Iona. She had been chartered to lay the cable in place of the normal government cable ship *Monarch*, owing to the shallow water. The new motor ship *Macdhui*, when running her trial in the Clyde on Mar. 9 exchanged wireless messages with her owners in Sydney. This is claimed as a new wireless record for shore-to-ship communication, says the *London News*. **SOUTH AFRICA.**—The African Broadcasting Co. is considering the erection of a new station to replace the present one, in addition to short-wave transmission stations proposed at Cape Town and at Durban. **SWITZERLAND.**—The new Geneva station has been completed and is situated on the Plateau de Lancy and has a power at least four times that of its predecessor. Tests have also been carried out on the new 25-kw. broadcasting station, recently manufactured at Sötens by Standard Telephones & Cables Ltd. **TURKEY.**—*A mosque as broadcaster.*—It is stated that the great mosque of Saint Sophie, in Constantinople, has been converted into a broadcasting station. Its four minarets are used to support the aerial and the nave, so it is said, is used as the studio. It is further understood that the transmitter will be mainly employed for Mohammedan propaganda. **U.S.A.**—*Cars and Receivers.*—According to the latest return issued by the United States Board of Trade there are 13,478,000 listeners in America. A feature of the return says *The Electrical Review*, is that the number of radio sets is proportional to the number of motor cars. *Singing and Talking Radio Pillows* are now in use for hospitals and Pullman cars, having just been developed by the Engineering Products Division of the Radio Corporation of America Victor Company, Inc. The radio pillow is of regulation hospital size and is made of specially selected sponge rubber, in which a sensitive reproducing unit is concealed. No sound is or can be heard until the tired head gently, or otherwise, comes to rest upon the magic sleep-giver!

The Prophets!—The President of the Manchester District Institution of Gas Engineers said he "was quite convinced that electric light would not supersede gas for domestic illumination, &c.—*The Electrician*, Mar. 19, 1881.

J. J. T.

READING DISTRICT: POST OFFICE. TELEPHONES CRICKET CLUB.

THE second whist drive and dance in connexion with the Post Office Telephones Cricket Club, was held at the Cadena Cafe, Broad Street, on Mar. 18. There were 33 tables for whist, and a large company for the dancing, to the strains of the Savannah Dance Orchestra. The company included the Mayor and Mayoress of Reading, Mr. and Mrs. C. F. Moorhouse, Mr. Magnall, Capt. and Mrs. Hill, and many members of the Telephone Service. The Mayoress, who distributed the prizes, was presented by Mrs. Moorhouse with a bouquet of carnations. The Mayor presented Mrs. Moorhouse with a bouquet of tulips.

SOME IMPRESSIONS OF A CONTRACT OFFICER AT THE BRITISH INDUSTRIES FAIR, OLYMPIA.

OLYMPIA! That Mecca of all those who keep pace with progress in this progressive age. Here, the British Industries Fair is held, displaying to the world, like a gigantic bazaar, the wonders of British craftsmanship, and showing no signs of the decay which is heard so much of to-day. It is pleasing to record, that at this year's Fair, the P.O. Telephone Service lined up with Big Business, and proclaimed itself the vital necessity it is in these modern times, and not the luxury some think.

I had been deputed by my Chief to appear at the Stand, to offer the public advice, answer queries, and, of course, secure as many orders as I could, and it was with a feeling of pride, a heart full of hope, and two fountain pens full of ink, I took up my position on the opening day. In front of me, on the table, was a goodly stock of literature and a hand microphone, backed by the miniature red-paper "kiosks," which took the eye of young and old alike, reminding the young, no doubt, of the fairy castles they read of in their story books. At the rear of the Stand hung bright and many-hued posters, giving it a colourful appearance, and arresting the attention of passers-by.

Much interest was shown by the public in the automatic working model, and frequently one heard expressions such as "Marvellous!" "Amazing!" This peep behind the scenes conveyed to them the wonders of a system which, alas, some of them abuse so lightly.

Another feature of great interest was the Teleprinter, ticking away messages on the tape. Once I saw an anxious looking individual who had evidently had a "flutter" on a horse race, rush to the tape and scan it, in the belief that the "winner" was coming through.

There were many queries from subscribers, particularly in regard to the method of recording calls, but patient explanation, and a demonstration by the officers in charge of the working model of the automatic system, invariably sent them away satisfied that the call-recording system is, so far, the most infallible devised. Naturally, many diverse characters were met, and interviews commonplace, interesting, and humorous, took place. I shall remember one for a long time. I had observed a gentleman who, judging by his expression, was straining violently to understand the demonstration of automatic working. When the particular demonstration had ended, I approached him with a view to securing an order. Evidently he could not hear me, for, extracting a snake-like contrivance from his coat pocket, he lunged with one end of it towards my face, placing the other end in his ear, and then stood as if he expected an explosion. I prepared for the worst, but nothing terrifying happened, and I realised he was deaf and wished me to speak through the tube, for such it turned out to be. I spoke in a moderately loud voice, assuring him that we had aids even for the deaf, but he smiled, that maddening smile which the stone deaf can produce, and said, "Can't make the deaf hear!" I bellowed, but in vain, and he walked triumphantly away, determined, I am sure, *not* to hear. It was with some trepidation that I approached the next "prospect," and spoke quietly, to feel my way as it were, in case she, too, were deaf. She was not! Neither was she dumb!—but the least said the better.

Large groups periodically assembled at the Stand to witness the demonstrations, and as they dispersed, friends and acquaintances could be heard eagerly discussing the merits of the system, thus proving that publicity pays. I think it is no exaggeration to say that the P.O. Telephone Stand at Olympia drew as many of the public as any.

J. S. J.

LONDON ENGINEERING DISTRICT NOTES.

New Exchange Progress.

THE installation of the equipment at Leytonstone Exchange is nearing completion, and arrangements have been made, subject to Secretarial authority, to open the exchange with approximately 1,700 subscribers from Maryland, Wanstead, and the hypothetical Leytonstone on Walthamstow, on Thursday, May 7.

Equipment of a total capacity of 30,000 lines is being installed at Hampstead, Prospect (Barnes), Whitehall, Acorn, Perivale, and Southall. The last 3 exchanges are designed in the new single sided rack scheme, and Perivale and Southall Exchanges are dependent upon Acorn Exchange for manual board facilities, both Assistance and Keysender "B."

Considerable alterations are being effected at Reliance Exchange by the installation of the sub-tandem equipment, which is due to be completed in August. This is the first of a probable 4 such exchanges on the edge of the 5-mile circle designed to relieve Tandem Exchange of a considerable portion of the traffic originating at automatic exchanges outside this circle.

Voice Frequency Keysending from "A" Positions.

Preliminary work is commenced at several exchanges in this district. This work will be of some considerable magnitude, and the difficulties encountered at certain of the older manual exchanges in fitting the extra

apparatus are of no mean order. A large proportion of the manual exchanges will have to be completed before keysending into the first automatic exchange to be converted becomes an accomplished fact.

New Trunk Record Suite at G.P.O. (South).

The contractors are proceeding rapidly with the installation of the 60 new CLR (combined line and recording) positions on the floor of G.P.O. South, and the transfer of the circuits from the old positions may be expected during the next month or so. This is the first step in the introduction of the new exchange for Radio and Continental and Inland service, together with the "no delay" service on trunk calls.

Football: Civil Service Cup.

The L.E.D. team met Birmingham Civil Service eleven in the semi-final of the Civil Service (Lewis) Cup at the Civil Service Ground at Chiswick on Feb. 25. The London players were rather unlucky to lose by 2 goals to nil, as they held the upper hand for the greater part of the first half, when they had the assistance of the wind. After the interval, however, the play of the Birmingham team definitely improved, while the Londoners fell away badly. Dainty scored from a free kick taken near the penalty line 10 minutes before the interval, giving Birmingham the lead, while Hall, who had worked in from the right and was unmarked, got the second goal 17 minutes from time. Hawkins (for the winners) gave a splendid display of goal keeping, and his skill in keeping out the attack in the first half had a good deal to do with the victory of Birmingham.

London Engineering District Sports Association.

A meeting was held on Thursday, Mar. 5, in the Denman Street Dining Room, to consider how the interests of sport can best be fostered within the District, and to formulate proposals to that end. The chair was taken at 5.15 p.m. by the Superintending Engineer (Mr. E. Gomersall, O.B.E.) who was supported by Messrs. Ridd, Wright, and Fulcher (Assistant Superintending Engineers). Most of the Sectional Engineers were present, together with a large number of other ranks from all parts of the district.

The proceedings were opened by the Chairman, who said that it was quite evident that there was a good deal of talent in the London Engineering District. This was shown by the number of trophies which had been carried off by comparatively small sections of the staff, e.g. those gained by the Swimming and Chess Clubs. There were a number of known champions and experts in various branches of sport in the district, and he felt sure that there were many more who were not known. He was of opinion that if we pooled all our resources we could provide for all classes of sport within the district and produce teams which might enter for various Service competitions, including the Duke of York's Cup. Such an Association would also enable inter-sectional competitions to be held. Mr. Gomersall thought there were great possibilities in the scheme, but it could only be worked if everyone, both at Headquarters and in the Sections, pulled together in the matter. The Chairman then asked Mr. Kelly to give a brief survey of the present activities in the district.

Mr. Kelly said that the following groups and organisations already existed in the London Engineering District:—

- (1) Association Football.
 - (a) Clay Cup Competition, which is Inter-Sectional.
 - (b) Civil Service Lewis Cup Team.
 - (c) City Internal, Tottenham, and Reliance Section Clubs.
- (2) Chess Club.
- (3) Cross-country team for Civil Service championship.
- (4)—(a) Swimming Club which covers the District, and runs an annual Inter-Section championship.
- (b) A club in the Holborn section of the Centre Internal Section, known as "The Autoquatic Swimming Club."

He also outlined what it was hoped could be accomplished by a district organisation:—

Association and Rugby Football.

- (1) Form an inter-section League and cup competitions.
- (2) Enter teams for the various Civil Service competitions, playing trial matches within the district in order to select the best teams.
- (3) Form a representative team for the best senior league possible.

Cricket.—On similar lines to football.

Athletics.—To hold an annual sports meeting and enter for Civil Service and other championships.

Other sections would include Boxing, Billiards, Bowls, Chess, Golf, Hockey, Netball, Motor Cycling, Swimming, Rowing, Tennis Clubs.

Mr. Leader then gave some figures showing what would be the probable cost of a Sports Association, based upon a small subscription from each member, and assuming that 33% of the staff would join.

A general discussion then took place, in which a considerable number of those present took part. Support was promised and difficulties considered,

and finally a provisional committee was elected, with Mr. Ridd as chairman, to further examine the possibilities and to prepare a questionnaire for submission to every member of the staff in order to ascertain the probable amount of support which would be forthcoming. The committee were also asked to determine from the replies whether it would be possible to set up a District Sports Association.

The proceedings terminated with a hearty vote of thanks to the Chairman, and in reply Mr. Gomersall said he hoped everyone would do his best to make the thing go.

The Duke of York's Cup.—A few days after the meeting referred to above was held a letter was received from the Secretary, Civil Service Sports Council, stating that Sir Oswyn Murray, the chairman of the Sports Council, has awarded the Duke of York's Cup for the best Departmental Record for 1930 to the London Engineering District.

The cup, which is given for the best Departmental Sports record during the year, will be presented to Mr. Gomersall at the Treasury on Thursday, April 9, by Sir Warren Fisher. We heartily congratulate the London Engineering District on this striking addition to the trophies already gained. It is one which should give much encouragement to those who are working to form a new Sports Association, to which we wish every possible success.

WESTERN DISTRICT NOTES.

On Feb. 21, eighteen members of the District Manager's Male Staff undertook a half-day excursion to Plymouth for the purpose of seeing Plymouth Argyle and Preston North End in a Second Division League engagement at football.

The trip was planned many months before the fixture and was primarily intended to serve as a social event to bring the male staff more into contact with each other. Unfortunately the Argyle were occupying a very unsatisfactory position in the league table by this date, and we had every hope of seeing a hard contest between the strong Preston team and the "Pilgrims" who were then, as now, badly in need of points. The day was a most brilliant one from the point of view of the weather, and this was the outstanding feature which made the trip so enjoyable. At football we saw a very evenly contested first half and then saw our own county men out-classed in the second half. Tea at "Goodbody's" and "first house" at the Palace concluded the day for some of the party who returned to Exeter at midnight, feeling that quite enough enjoyment had been crammed into the previous 12 hours.

At a certain "Appointed Office" for taking down telegrams, difficulty was being experienced in taking down a telephoned-telegram from a small sub-office. The rather elderly sub-postmistress, after making great efforts, at last, in desperation said, "I will spell it by phrenology."

On Mar. 6 the "parting of the ways" was reached by Mr. A. Bennett, Clerical Officer in the Accounts Section of the District Manager's Office. "Bee Bo" has spent the greater part of his service in Plymouth where he was Cashier, being transferred to Exeter on the formation of the Western District in 1925. To bid Mr. Bennett (who was accompanied by his wife and son) farewell, practically the whole of the staff of the District Manager's Office attended, and in a few well chosen remarks, Mr. T. A. Beck, the District Manager, referred to Mr. Bennett's long and faithful service and asked him to accept an oak bureau, portable electric table lamp and fountain pen, with the best wishes of the staff for a long and happy retirement.

Mr. Bennett replied very feelingly and at some length, and said he particularly remembered a former District Manager of the old Plymouth District, giving him a slap on the back and saying, "Bennett, this is a red letter day, the first Exchange in Cornwall is opened to-day."

At a small Cornish town a coloured man one day presented himself at a call office and asked the attendant for a pint of beer. After recovering from his surprise the attendant said, "This is a Telephone Call Office." The caller said, "But the sign outside says 'PUBLIC!'"

At a certain exchange call office a very rural small farmer came to telephone to a lawyer in the neighbouring market town. As he had never spoken on the telephone before, he asked the caretaker-operator to "speak" for him. To her astonishment the message he wished passed was as follows:—

"Vather's dead and we vound a copy o'es will and tidden vair, wull'e coom over and maae a vresh'un."

At a remote little Cornish fishing village, the local post office closes at mid-day for an hour. One of the villagers wished to buy a stamp to post a letter during the closed period, but he was, of course, unable to do so, automatic stamp machines not yet being justified. The procedure he adopted was as follows:—

He posted the letter without a stamp, and when later the office was opened, he bought a stamp and posted that also.

The District Manager's staff held a very successful whist drive and dance, the second for the season, on Mar. 6, at Deller's Cafe, Exeter. About

200 members of the staff and their friends were present and spent an enjoyable evening. Mr. T. A. Beck, the District Manager, presented the whist prizes, and a prize was also given for a miniature bridge drive which followed the whist. The card games proceeded concurrently with the dancing. The latter was particularly enjoyable because the orchestra was increased in size, was of good quality, and the dancers were restricted to a number which assured every comfort for those present.

The District Manager's staff were very pleased to see three of the Plymouth Supervising Staff present, particularly Miss Westlake, Chief Supervisor of the Plymouth Exchange, who has made such a wonderful recovery after a rather serious operation.

F. J. F.

LEEDS DISTRICT NOTES.

THE Sixth Annual Dinner of the West Yorkshire Surveyor's Office was held at the Mansion House, Roundhay, on Feb. 21, upheld its reputation as a function which combines entertainment of a high order with complete absence of formality. Mr. P. S. Fewster was in the chair, and the guests of the evening were:—Lt.-Col. Jayne, D.S.O., M.C., O.B.E. (Postmaster-Surveyor); Mr. J. Bownass (Assistant Postmaster); Mr. J. F. Murray (District Manager).

After the covers had been removed, Col. Jayne, in response to the toast of his health, expressed his thanks at being once again invited to what he termed "the happiest function of the kind he ever attended." He also expressed his appreciation of the sound work performed by all ranks in the Survey Branch, and thanked all who had upheld the good name of the W.Y.D. throughout the past year.

The artistes in the excellent programme which followed were all past and present members of the Survey Branch, and difficult though it is to particularise, we feel that special mention must be made of the "Flying Cross-word Handicap," the Basso, the little Comedian (and his hat), and the Purveyor of Birthdays. Neither can we omit the organiser of the function or the compiler of the uniquely worded programme.

The success which has attended the efforts of the Social and Discussion Circle encouraged the Committee to adventure in a new type of entertainment to cater for the non-dancers and the non-whist players. This took the form of a Progressive Games evening at the Guilford Hotel, Leeds, on Feb. 16, and appeared to capture the popular imagination to such an extent that the demand for tickets exhausted the supply in 3 days. The programme arrangements resembled those at a whist drive, but at each of the 28 tables was a "game of skill"!! e.g.:—

Picking up peas with knitting needles.

Fishing for shoe buttons with a bent pin on a miniature fishing rod.

Recording 15 objects on a tray seen for one minute.

Flapping paper ducks across a stretch of floor by means of folded newspapers.

Possibly the most riotous laughter was to be found at the "chocolate feeding" table. There the players were blind-folded and each supplied with a teaspoon. A saucer of chocolate drops was in the centre of the table and the object was to pick up a chocolate drop with the spoon and feed it to the partner opposite. The spectacle of a telephonist vainly trying to poke a chocolate into the ear of the Traffic Superintendent who had his mouth open so wide that one would have thought it impossible to miss, was really irresistible. At one round of this game an ash tray had inadvertently been left on the table, and the official watch-dog was only just in time to stop a spoonful of the contents being fed to an unsuspecting victim.

During the evening refreshments were served and Mr. Murray (District Manager) gave an outline of the objects of the Social & Discussion Circle and the arrangements for next season. Mrs. Murray then presented the prizes, and the remainder of a very enjoyable evening was rounded off with a musical programme supplied by Misses Hogan, Whitaker, Taylor, and Hobson.

The official opening of the new C.B. Exchange at Rawdon on Mar. 3 was made unusually interesting by the presence, as a guest, of Mrs. Hansen, who in her youthful days was the first operator when the original Rawdon Exchange was opened in 1886! We were intrigued to learn that subscribers used to grumble occasionally even in those days, and that calls to Leeds and Bradford were 50% more expensive than they are now.

A sidelight on the perplexing problems of the "Newly-weds" was cast by a beseeching voice overheard on a call office call on Shrove Tuesday morning to say, "Mother, do you put baking powder in pancakes?"

Obituary.—We regret to record the death of Mr. G. H. Hamer, Contract Officer, Class I, from pneumonia, on Mar. 15. Mr. Hamer who came to us from the Western District in April, 1930, had a cheerful and kindly disposition in spite of the fact that he did not enjoy the best of health, and the news of his untimely end at the early age of 48 came as a great shock to the staff. Mr. Lowe (Contract Manager) and Messrs. Bowring, Beardsall, and Cromack represented the staff at the funeral on Mar. 19.

CONVERSION OF NEWCASTLE-ON-TYNE AREA TO AUTOMATIC WORKING.

By F. J.

THE automatic telephone exchanges in the Newcastle area which were brought into operation at midnight on Jan. 31, 1931, displaced in Newcastle itself two main exchanges which have had an interesting history. The City Exchange, opened at the Head Post Office in June, 1906, substituted the ingenious system established in 1882 by Mr. A. W. Heaviside, Superintending Engineer. In the earliest days of telephony, i.e. in 1881, the Post Office began to replace Wheatstone ABC telegraph instruments rented to subscribers by telephone instruments, and in this way inaugurated a system of telephone switching.

The Central Magneto Exchange situated in Pilgrim Street was, before its closing, the oldest exchange of its type extant in this country. It was opened by the National Telephone Company in 1896. Prior to that year, i.e. in 1882, the Company had commenced to give telephone service in Newcastle-on-Tyne. The original switchboard installed gave place to a "twin jack" switchboard of unique design which was eventually displaced by the magneto switchboard, which in its turn has now passed into desuetude.

The transfer to automatic working now effected, has involved, altogether, the closing of the following manual exchanges:—Newcastle Central, Newcastle City, Newcastle Central Relief, Benton, Felling, Gateshead, Gosforth, Gosforth Relief, Jarrow, Kenton, Low Fell, Wallsend, and Whickham. These have been replaced by twelve automatic exchanges as mentioned below.

The Newcastle Area Automatic Scheme is designed to deal ultimately with 70,000 subscribers' lines in the area served, having exchange numbers from 20,000 to 89,999. The system is, therefore, a five-digit one.

The parent exchange, Newcastle Central, is at present designed for 15,700 subscribers direct exchange lines, of which approximately 7,900 are at present equipped. Of the 125 verticals on the main distribution frame, 96 are now equipped on the line side, giving an equipment for 21,120 lines. On the exchange side 69 of the 125 verticals fitted provide equipment for 13,800 lines.

The intermediate distribution frame for the distribution of all junctions to various manual positions and selectors in order to equalise loads has 100 verticals fitted, which at present are partially equipped. Each vertical will accommodate 200 lines.

At the test desk 7 positions are fitted. Position No. 1 has 30 extension lines to break jacks for testing trunks and junctions, while positions Nos. 2 to 7 for general testing have 14 test distributor circuits for testing new subscribers' lines.

The line switches, individual to each subscriber, at the Central Exchange, provide for 7,900 working lines, so that only approximately one half of the ultimate capacity of 15,700 is at present equipped. The selectors fitted are 1,810 first, 1,653 second, 1,014 third, and 39 fourth (for large P.B.Xs). The ultimate capacity for final selectors is 7,768, and 1,834 have been initially fitted.

The Plenum ventilating system in the apparatus room is worthy of mention. It is controlled by a motor on the roof connected to a centrifugal fan, 20 inches in diameter, making 800 revolutions per minute. About 3 changes of air in the main room per hour are made, approximately 7,200 cubic feet of air being drawn through the filters per minute. The air is passed through ducts to various parts of the room and finds exit through mica flap non-return ventilators fitted in the windows.

In the Auto-Manual Room there are 3 suites of switchboards providing a total of 102 positions. The trunk switchboard is fitted with 30 positions of which at present 26 are in use. The positions are capable of being concentrated in any variation required. The arrangement of the auto-manual board A B suite is as follows:—

- Position Nos. 1 and 2.—Jack-ended junction positions.
- „ No. 3.—O.W. key-sending B position.
- „ Nos. 4 and 5.—J.E. trunk position.
- „ Nos. 6, 7, 8, and 9.—J.E. junction positions.
- „ No. 10.—Mixed J.E. junction and service position.
- „ No. 11.—Service and rural party line position.
- „ Nos. 12 to 45.—A positions.
- „ No. 46.—Plugging up position (faulty lines).
- „ Nos. 47, 48, 49.—Unequipped.

The General Enquiry switchboard is equipped for 23 operators but the number of positions in use has, since the opening of the exchange, normally been 18, and it is anticipated that the number will fall to 15. In addition there are tables to accommodate 12 operators for directory and trunk enquiries and also 3 supervisors desks.

The main power for the system is led in at 6,000 volts 3-phase alternating, and is transformed by two transformers of the air-cooled type down to 430 volts. Two motor generators of 139 B.h.p. give 91 kw. output from 1,825 amps at 50 volts to 1,350 amps at 68 volts. A Ruston Hornsby oil engine of the vertical type, 5 cylinder, of 168 h.p. is in reserve. Two ringing machines, of 1½ h.p., one on the power main and one from the battery, have been installed. The change-over from power to battery, if the former is stopped, is automatic. There are two sets of batteries, each of 25 cells. The capacity is 10,000 ampere hours and at present one discharge lasts about 3 days.

The eleven satellite exchanges associated with the Newcastle Central Automatic Exchange are as follow:—

		<i>Present Equipment.</i>	<i>Ultimate Capacity.</i>
Newcastle East	...	1,520	4,600
Newcastle West	...	1,520	4,400
Wallsend	...	800	2,700
Benton	...	665	1,400
Kenton	...	110	200
Gosforth	...	1,615	4,400
Gateshead	...	1,425	4,500
Jarrow	...	570	1,100
Low Fell	...	950	3,400
Felling	...	285	800
Whickham	...	190	600

The first two operations of the dials associated with all the satellite exchanges except Kenton are served by the first and second selectors at the parent exchange as well as by discriminating selector repeaters at the satellite exchanges themselves. The alarm circuits at the satellites are extended to the Central Exchange, and in periods when the former are unattended, any abnormal conditions which may arise are promptly recorded at the main exchange and dealt with from that centre.

It will be evident that only a brief outline of the system is possible in the course of a short article and numerous items of interest have had perforce to be omitted. It only remains to be stated that the whole of the automatic equipment for all twelve exchanges has been manufactured and installed by the Standard Telephones & Cables Ltd., and the Company, as well as the Post Office, can take pride from the fact that a simultaneous conversion to automatic working of twelve exchanges has been achieved with complete smoothness and freedom from interruption of service.

NORTH WESTERN DISTRICT NOTES.

WE must apologise to all concerned for part of these Notes being written in lighter vein, and can only ascribe their nature to the early arrival of Spring.

Note 1.—“How to be Happy Though Married.”

A subscriber called upon one of our Head Postmasters recently and reported he had experienced a little domestic trouble at home, and could we please send a man round to put the telephone right? In due course our Engineering Officer attended and reported:—

- (i) The “Block” had been torn away from the wall and was hanging loose.
- (ii) The cord had been cut—apparently with scissors—and was strewn about the room; and
- (iii) the instrument had disappeared.

We are wondering, here, what would have happened had there been a big domestic difference in that family?

Note 2.—Dials v. Dialects.

A letter received the other day from a subscriber read—*inter alia*—as follows:—

“I refuse to have an automatic telephone installed because they are not yet perfect.”

Apart, altogether, from the fact that to reach “perfection” is a state toward which many strive but very few attain (and they, alas, only in their own estimation), it should be mentioned that the writer is a proprietor of several cinemas. In one of the local cinemas, recently, considerable hilarity was caused during a “talkie” when the heroine was heard to declaim in a deep bass voice (slightly tinny) her undying affection, following which her murmured acceptance was heard when her (and his) lips were otherwise engaged.

Things we should like to know.

Is it correct to credit a subscriber with “time lost” on a trunk call owing to his having observed the two minutes’ silence during its (meaning the trunk call) connexion? It must, of course, be assumed that no mention of the fact will be made by the subscriber until his account is rendered two months later.

What does an operator mean when she enters a subscriber’s circuit and says “Numplee”?

Blackpool.—The many friends and acquaintances will read with regret the news of the retirement of Mr. John Gott, Assistant Superintendent. His dominating personality and tremendous energy will be remembered by those who in the old days, came to this office for seasonal work. He had the reputation of obtaining the last ounce out of the staff during the days when the rights of the worker were not as clearly defined as at present. Despite his vigorous methods, however, he had always a sympathetic ear for those in distress, and his many acts of kindness endeared him to all those who had the privilege of knowing him.

He came to Blackpool from Burnley in 1898 as S.C.T., and his outstanding qualities soon earned him promotion as Overseer, and eventually Assistant Superintendent, which position he held for 23 years. During the autocratic regime of Mr. Jones he was one of his stalwarts, and under the academic Mr. Worthington, one of his most able lieutenants.

It is indeed unfortunate that illness has necessitated his retirement a few months earlier than that demanded by the age limit, and his many friends will wish him a speedy recovery and a long and happy rest from his labour.

Barrow-in-Furness.—The Barrow-in-Furness football team has reached the semi-final for the Asst. Surveyors’ Shield. The match between Barrow and Preston, which should have taken place on Wednesday, February 25, had to be postponed owing to the sickness of members of both teams and at the time of writing it is hoped to play the match at Lancaster on the 18th instant. Our confidence is such that a suitable place for the exhibition of the shield is being prepared at the Barrow Post Office, but if Preston should prove the better team, we shall keep the space clear for next year.

The staff of the Barrow-in-Furness Post Office held a most enjoyable dance in the spacious ballroom of the Victoria Park Hotel on Friday, Feb. 27, when approximately 175 persons were present. The celebrated Ambassador’s Dance Band provided the musical programme in their usual capable manner. There were no late attendances on duty on Saturday.

The Preston Post Office Sports Club had a real jolly dance at the County Hall, Preston, last month. There were close upon 1,000 ladies and gentlemen present including everybody of note in the official life of Preston. The only “fly in the ointment” was that 2 a.m. came all too soon. Marvellous to relate it was a fine morning when the dance concluded and those who couldn’t afford to ride managed to get home dry (externally, at any rate).

Besides the dances referred to highly successful and enjoyable functions have been held by the staffs of Southport, Lancaster and Penrith. These are however, rather ancient history now, but the latest—that of Carlisle—which was held on Friday, Feb. 6, may perhaps, be commented upon at length.

Carlisle P.O. Telephonists’ Dance.—The Carlisle Post Office telephonists inaugurated on Friday night what they hope will become an annual social event, when they held their first ball in the Crown and Mitre hall. There were about 180 present, and dance music was played by Don Wilson and his orchestra. There were numerous novel effects. Amongst those present were Brigadier-General E. L. Spears, Mr. Pearce, the Postmaster at Carlisle, and Mrs. Pearce, and members of the district office staff. The arrangements were made by Miss Hilda Watson, Miss Edith Fox, Miss Gwen Daykin, Miss A. Veitch, Miss A. Ravey, Miss May Bickerdike and Miss Madge Henderson.

GLASGOW TELEPHONE NOTES.

At a recent meeting of the Glasgow Post Office War Hospitals Entertainments Committee, the Secretary reported that seven entertainments (since increased to ten, including a visit to the Princess Theatre) had been given since October, 1930. Everyone was thoroughly enjoyed and an urgent appeal was made to the Committee by the patients and staff at Bellahouston Hospital to continue the entertainments at Erskine Hospital which was to be their new abode. While the income is not up to last year’s figure, no serious difficulty is anticipated in carrying out a programme similar to that of 1929-30. The thanks of the Committee were expressed as due to the Telephone Staff for their splendid support.

The staff of the Western Exchange entertained the patients of the Ralston Hospital on Mar. 13, when an enjoyable and successful evening was spent. The staff were well represented. Mr. A. E. Coombs occupied the chair in his usual genial and able manner, and we were glad to see Mrs. Coombs present in support of the entertainment. An excellent programme was given by members of the staff and friends. Cigarettes were distributed, and the Dance Committee provided fruit from the balance of their funds.

Marriage.—Miss J. M. Kirkwood, South Exchange.

On (the Benefits of) Procrastination.

Yet is there some advantage in delay (*Aeschylus*).

What is deferred is not lost (*Don Quixote*).

Trae-de-Luer (Time enough yet) (*Manx adage*).

Little books are occasionally published in which we are told that it is a sin to lose a minute. From the intellectual point of view this doctrine is simply stupid. What the Philistines called wasted time is often rich in the most varied experience to the intelligent. Any person gifted with ordinary common sense can perceive that life is short, that time flies, that we ought to make good use of the present; but it needs the use of much experience, with the most consummate wisdom, to know exactly what ought to be done and what ought to be left undone—the latter being frequently by far the more important of the two. *It frequently happens that procrastination, which is reported to be the thief of time, becomes its best preserver.* Suppose that you undertake an enterprise, but defer the execution of it from day to day: it is quite possible that in the interval some fact may accidentally come to your knowledge which would cause a great modification of your plan, or even its complete abandonment. Every thinking person is well aware that the enormous loss of time caused by the friction of our legislative machinery has preserved the country from a good deal of crude and ill-digested legislation. Even Napoleon the Great, who had a rapidity of conception and action so far surpassing that of other kings and commanders that it seems to us almost supernatural, said that when you did not quite know what ought to be done it was best to do nothing at all.—(*Hamerton*.)

Napoleon directed me to leave all letters unopened for three weeks and then observed with satisfaction how large a part of the correspondence had thus disposed of itself and no longer required an answer.—(*Bourrienne*.)

Of the perils incurred while travelling in the awe-inspiring devices by which I was transferred from place to place, of the utter absence of all leisurely dignity on the part of those controlling their movements, and of the almost unnatural self-opinionatedness which led them to persist in starting at a stated and pre-arranged time, even when I had courteously pointed out to them by irrefutable omens that neither the day nor the hour was suitable for the venture, I have already written. It is enough to assert that a similar want of prudence was maintained on every occasion, and, as a result, when actually within sight of the walls of this city (London), we were involved for upwards of an hour in a very evilly-arranged yellow-darkness, which, had we but delayed but a day, as I strenuously advised those in authority, after consulting the Sacred Flat and Round Sticks, we should certainly have avoided.—(*Kong Ho*.)

This to-morrow of yours

Lasts for ever.—(*Geronimo De Cuellar*.)

Haste is a fool’s passion.—(*Gracian*.)

Worse it is to be busy in foolish things than to do nothing.—(*Gracian*.)

There is a sublime prudence which is the very highest that we know of man, which, believing in a vast future—sure of more to come than is yet seen—postpones always the present hour to the whole life; postpones talent to genius, and special results to character.—(*Emerson*.)

He tires betimes that spurs too fast betimes.—(*Shakespeare*.)

THE CENTRAL TELEGRAPH OFFICE LIBRARY.

Of the recreative staff organisations which have best stood the test of time and changing circumstances, there is little doubt but that of the C.T.O. Library would take pride of place. Established in 1887 it has been fortunate in having a succession of Librarians whose knowledge and enthusiasm has never failed its members. Difficult, indeed, would it be to find another such organisation within the limits of the City of London, which, self-supported, and established over forty years and more ago, can still show a steady, almost uninterrupted rise in membership, and an annual "Book-exchange" of, in round figures, fifty thousand volumes.

It is true that the membership for 1930 dropped by 44, and the number of books exchanged by three thousand compared with the figures of 1929, but the fact that the C.T.O. staff has itself suffered a reduction of over six hundred in its male staff, including 108 transferred to the Beam Wireless Company, more than adequately accounts for these comparatively small decreases. As proof of the vitality of the Library, the Committee was able to add no less than 991 new books during the same twelve months, and as proof of their business acumen were also able to dispose of practically an equal number of old and well-fingered volumes at a good market figure! Ascending from quantities to quality it may also be safely said, and at once, that the choice of book is nothing if not catholic in its tastes. The latest classification shows two new sections, Topography and Criminology!

The Library functions under the presidency of the Controller, J. Stuart Jones, Esq., M.B.E., and a representative committee of 22 (men and women) of the members. The indefatigable Librarian, Mr. A. Pethurst, is splendidly supported by his assistant, Mr. J. M. Roe. One of the secrets of the Library's success is probably the few changes which have been necessitated in the holders of the office of Librarian, only three, viz., Mr. A. E. P. Butt, 6 years; Mr. C. Belsten, 18 years; and the present holder 19 years, except during the war period, when the duties were ably carried out by the late and much regretted Mr. W. H. Bates, in Mr. Pethurst's absence.

As these all too inadequate comments on the 43rd Annual Report of the C.T.O. Library happen to coincide with the retirement from the Telegraph Service of the well-esteemed Mr. Herbert Parker, who has served in every position on the Library during his 43 years membership, such comments would have proved even more inadequate had this simple but telling fact been omitted.



L. to R. (standing), A. PETHURST (Librarian); A. W. YORK (Deputy-Chair).
L. to R. (sitting) J. M. ROE (Asst. Lib.); L. BARTINGTON (Chairman).

Owing to the difficulty of assembling all concerned in the management of the Library for photographic purposes, the above is reproduced as a representative quartette!

J. J. T.

C.T.O. NOTES.

THE "Centels Operatic and Dramatic Club" successfully presented the well-known musical comedy, "Miss Hook of Holland," at the Guildhall School of Music on Feb. 3, 4, and 5.

The outstanding feature of the production was the work of the chorus—it was indeed excellent, and it is doubtful if any other Service Club possesses a mixed chorus of the strength and beauty of this chorus.

The principal parts were extremely well portrayed by Miss Winifred Lenthall as "Miss Hook," Miss Bryan as "Mina," and the male parts, Mr. Arthur Boyce as "Mr. Hook," those two clever people, Mr. A. W. Haddock

and Mr. Stanley Doel, as "Schnapps" and "Slinks" respectively, and Mr. Lawson Barrett as the Bandmaster, rounded off a very efficient cast.



The orchestra, under the direction of Mr. Charles Daggett, was small but very sound, and Mr. Daggett is to be congratulated upon his very successful first appearance.

The whole production was in the very capable hands of Mr. Donald Bidgood, and the C.O.D.O.C. are undoubtedly fortunate to be in the position to engage a producer of his standing.

LIVERPOOL NOTES.

In the Opinion of the Operator.

CONTROLLING Traffic Officers gain much valuable information from conversations with operators. Officially there are several barriers between a Traffic Superintendent in a large area and an operator, but there are many bridges. These may be outside social functions, farewell gatherings to retiring members of the staff, sporting events, &c., on all of which occasions, high and low (officially), proud and humble (socially), meet on terms of equality and comradeship. Even semi-officially on the stair or in the quarters, the two extremes at times make contact, and the opportunity for interchange of views and opinions occurs.

This brings me to the point that the operator who is the exponent and translator of the vast organisation of the Telephone Service to the great B.P. (and in fact to the world at large) is often-times the one person who can put her finger on a weakness or advise the best course of action in a difficulty. It is, therefore, very desirable that intimate relations should be encouraged between all ranks of Traffic and Exchange staffs, not forgetting the girl probationers who one day may be guiding the destinies of important centres of communication.

We extend our hearty congratulations to our Engineering friend Mr. C. Brocklesby, on his promotion to the rank of Asst. Superintending Engineer at Leeds, and wish him every success in his new post.

Thumb Nail Lecture at a Traffic Officers' Meeting with Operators: Smartness and Quickness.

"You will agree that there are qualities which all admire.

"If you go into a restaurant you soon notice the waitress who goes about her work with smartness and gives a prompt service.

"In a Telephone Service the subscriber cannot see this smartness but he can feel it. That prompt reply, "Number, please," uttered in a smart but pleasing tone, puts him in a good humour right away, and if anything should go wrong with the call afterwards, he is likely to be much more reasonable than if he had been put out from the beginning. Then again, smartness on the part of the operator is infectious and smartness begets smartness, thus its effect is cumulative.

"This also applies to her colleagues. They must be influenced by her proximity to them, and so this good quality should spread along the room.

"It is a quality which will relieve a supervisor of much of her worry and so render her more cheery, and, shall we whisper, less snappy, than she might otherwise be if she had to be continually pressing.

"Then again, it reflects on the quality of the service. It speeds up the whole machine. The call is completed sooner and thus ends sooner, and the circuit is not engaged for so long, thus we reduce the "engaged call" trouble.

"Therefore I would say, let Smartness and Quickness be one of your first ideals to live up to."

W. F. G.



The Vacuum Cleaner.

"AND thou beside me singing . . . paradise were wilderness enow," as Omar might have said, if Mrs. Khayyam had had a vacuum cleaner and he had stayed at home to help with the spring cleaning, instead of slinking off with a book of verse and a picnic basket. Nature abhors a vacuum and she is not alone in her prejudice. Bindle, the hound, dislikes ours. When the can of works first arrived he greeted it in a friendly way. He thought the whining noise it made was evidence that it harboured quantities of dogs, and he whined chattily in reply. Then the thing snuffed and he took up the challenge. He went to the door and snuffed good and hard, just to show those dogs how it should be done and how he could snuff. But after five minutes he retired from the contest. "Guv'nor," he said to me, "that thing could smell out an antipodean bone." Since then he has looked coldly upon it and now when it comes into action he shoves his cold nose into my hand, and says "It's time I took you for a walk." He hates me to operate the machine—and so do I—and at such times we go out silently by the back gate. Oh, yes, a very intelligent hound.

But prejudice apart, the vacuum cleaner is a wonderful machine with limitless possibilities in the service of mankind. It has a double action—that is, it can snuff and blow. When it snuffs it sucks up anything within reach (so be careful of the baby) and when it blows it blows like a grampus. (In case you don't know how a grampus blows I'll tell you. It blows like a vacuum cleaner in reverse.) The length of flex with which it is fitted serves ostensibly to convey power to the machine, but experience will show that this is merely a little bit of fun on the part of the makers. Its main function appears to be to curl round the ankles, to get into the most ingenious tangles and to pull out the plug from the point.

Most people make the mistake of supposing that the sole use of the vacuum cleaner is to extract dust from carpets, but the really resourceful person can find a multitude of other uses. It can be used, for example, when cooking to draw the milk through the macaroni or to extract the juice from lemons when the squeezer is missing. Are you troubled with lost collard-studs? A vacuum cleaner kept handy by the dressing-table will solve your troubles and save your knees. Does father drop tin-tacks in the bedroom? Keep a cleaner by your bedside, set it going when you wake and let the tacks collector save your sole. Do you smoke whilst eating? No! Then, of course, your pipe or cigarette goes out. A cleaner in the dining-room will keep your smoke going whilst you eat. Put the thing in reverse and you can draw up the fire, cool your porridge, blow the cinders off the toast and the flies off the butter. And at night when you go to bed—no more stubbed toes and cold feet—tuck yourself up cosily and let the machine blow out the candle.

You see the infinite possibilities—very well, then, let your slogan be "a vacuum cleaner in every room." It will conserve your energies and add years to your life—or take them off, I'm not sure which.

PERCY FLAGE.

A Telephonist's Idiocy.

IN the western part of Central Avenue we came to a mansion house just near an archway. It was marvellous scenery. A solitary looking monument of Victoria looking east towards the Bishop's gate made it even prettier. North of this lay a Tudor house in the midst of Burgh, Bexley, and Bushey heaths. Alongside ran an ember brook underneath an elm bridge. On the bank half hidden by tree trunks snuggled a lonely primrose.

Suddenly we forgot this picture of the riverside and arrived at the metropolitan City; the most interesting feature being Mayfair museum. It comprised in one part relics of the Old London Wall, photographs of the old Royal family, and Temple Bar in the 17th Century; not forgetting the Grand National pictures. Hungry, we came out and walked to the terminus of this street down which a tandem was driven furiously, and found a teashop. Replenished, we walked down land to the Albert Dock. We continued on through Harold Wood and the Spring Park, round Wembley corner and on to Orpington station. We got the train to Epsom and walked over the downs to try and find some silver thorn and hop.

Presently we met two boys, Will and Waltham Cross. They were very nice and made our journey less tedious. We came to an old well. I said it was "Speedwell" and Will said it was "Clerkenwell." They argued till they fought. Will started it by jumping on Waltham's toe. We eventually found it was neither as written on the handle was "The Old Chig-Well." Continuing our walk through grange wood we came to Will's den, a jolly little place with the stump of Goffs Oak for a seat. Just outside was a huge ugly tree called El's tree. I knew it was called this but the boys said it was one of the seven oaks. They fought over this. Will boxed Waltham's ears and called him a lout on running off, gave Will the ruislip. Waltham sutton his seat and sulked!

Well, after attacking a cunning ham for our supper we decided to go home. On the way we met Stan More sitting welbeck on Palmers' Green, watching a finchleyn on a Yule log. We talked awhile and moved on. I was terribly dirty, I ought to have put a pinner-fore on. Arriving at Sidecup station, we exchanged glances and parted.

They would have come home with us but they had a long journey, after going through the rye gate to the horn church, where they would just catch the last bus to Romford.

We got in our train only to find in our carriage Mr. and Mrs. Macaulay. They had been round Chiswick and Richmond for the day. I was most interested in this woman because she had a moleseyted on her face.

We soon got to Tottenham where I left my friend and toll-ed her I'd see her at Clissold in the morning. E. C. D.

[How many exchange names have you been able to pick out from the foregoing? There are 70 mentioned.—Ed.]

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

BIRMINGHAM NOTES.

Telephone Society.—Although the end of the present series is in sight the interest in the Lectures on Automatic Working, which were arranged by the Society, shows no sign of diminution.

The paper which was given on Feb. 19 last was by Mr. F. E. Ferneyhough, Assistant Traffic Superintendent, on the subject of "The Key Sender 'B' positions and straight forward junction working." Mr. Ferneyhough dealt with his subject in the most enjoyable manner. It was followed with the closest interest, and the enthusiasm it provoked testified to its appreciation.

The District Manager, Mr. J. L. Parry, presided.

The Lecture was followed by an Entertainment provided by members of the Traffic Staff, which was received with acclamation, and the evening was concluded with a little dancing.

Birmingham Automatic Scheme.—Saturday, Mar. 7, 1931, marked an important stage in telephone progress in Birmingham. On that day the months of preparatory work were brought to fruition in the introduction of the Director Auto System, and the opening of the new Toll Exchange in the Midland Building.

Four Exchanges—Northern, Harborne, Victoria, and Birchfields—were the first exchanges to be opened under this new system, and they are the forerunners of some 35 other exchanges which will ultimately be converted before the Birmingham Automatic Scheme is completed.

This initial part of the scheme involved the transfer of approximately 5,300 subscribers' lines and the introduction of a new junction network of some 1,500 lines. In addition, Call Display Working was introduced at 9 C.B. Exchanges. Everything was carried out "according to plan," and the success of the change-over was itself evidence of the spirit of co-operation that existed between the staff engaged in the work of the transfer.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of February resulted in a net gain of 3,847 stations.

There were 1,142 exhibitors at the British Industries Fair this year and 407 lines were provided. This represents 35.6% lines to exhibitors and is an improvement on the results obtained in any previous year.

Canvassers for telephone orders soon find out that a close study of methods of approach which are least likely to disturb the equilibrium of the public is an art well worth the closest attention.

Recently a contract officer made a return call on a subscriber and was received like this:—

Good afternoon! I know your face very well but cannot for the moment recollect whom you represent. In any case I am very pleased to see you, as whenever you come to see me you invariably have a smile. You must be permanently happy! And now what can I do for you?

Miss Wilson, shorthand typist until recently, attached to the S.E. Contract Office, resigned her position on Feb. 28, in order to be married, and was presented by the staff of the S.E. Contract Office with an oak clock. The District Contract Manager, in making the presentation, referred to the excellent work performed by her, and more especially her willingness to do all in her power to overcome the difficulties which had been experienced. It is understood that Miss Wilson is being married in Sheffield, but is later on returning to live in London.

West District Contract Office Notes.

MR. S. W. SHEARING.

The subject of the above photograph is Mr. S. W. Shearing, Contract Officer, Class II, attached to the West District Contract Office, London Telephone Service.

After his war service, Mr. Shearing served for short periods at the War Office, the Accountant-General's Department and the Secretary's Office in the Post Office, finally being appointed in 1924 a Contract Officer in the London Telephone Service.

A district in the neighbourhood of Kensington was allocated to him, and after careful and intelligent survey he decided to devote special attention to the hotels and larger boarding houses existing within his territory.

After a period of hard spade work and persistency, the first hotel fell to his arguments in October, 1927, and thus paved the way to future business. From his initial success, Mr. Shearing has been able to secure private branch exchange agreements from 29 hotels for installations varying from 16 to 265 stations.

It is worthy of note that Mr. Shearing's personality so impressed the directors of a large firm of hotel proprietors in London, that he was pressed to journey to Blackpool to make arrangements for an installation at a large hotel in that town.

London Telephone Service Sports Association.

Bowls.—Owing to the shortage of sufficient bowls members the club will not be able to continue its membership of the Departmental League Competition during the ensuing season.

A proposal was submitted to the London area Committee asking them to consider a scheme which would have enabled two rink matches to be played instead of the present arrangement of three rinks.

This proposal was found to be impracticable, and although we met with a large measure of sympathy from the clubs, our unfortunate position regarding players could not be met.

The club was formed in 1927, so that we have been in existence four years. During this period the Bunbury Cup was won in 1929 in the first year it was competed for by the whole of the Service Clubs. Several of our players have taken part in International and County games, and our existence, although brief, has not been without achievement.

Dinner and Presentation to Miss A. E. Cox.

On Feb. 26, about 180 members of the supervising classes of the London Telephone Service entertained Miss Agnes Cox, their Superintendent, at dinner, in recognition of the honour conferred upon her by His Majesty the King, in creating her a member of the most excellent Order of the British Empire.

The honour was announced in the New Year's "Honours" List, and the Investiture took place at Buckingham Palace on Feb. 24.

After an excellent dinner in the refreshment room at G.P.O. South, Miss E. D. Beaumont, Deputy Superintendent, in a charmingly happy speech in which she referred briefly to Miss Cox's career in the Service, and to the circumstances in which the function was being held, asked her acceptance, on behalf of the supervising classes, of a beautiful diamond ring, and proposed a toast to Miss Cox.

In replying to the toast, Miss Cox said that she was completely overwhelmed, not only by the size of the gathering, but by the spirit of it. She thanked the supervisors for the gift of the ring, which she said would always remind her of the happy associations of this evening, and of the goodwill of her staff. Miss Cox told the gathering the history of the notification of the conference upon her of the honour, and very aptly described her visit to Buckingham Palace for the investiture.

Miss E. Nurse, the Supervisor of the Trunk Exchange, then passed a vote of thanks to the G.P.O. South Refreshment Club which had so excellently carried out the dinner arrangements, and made reference to the fact that Mr. Dobson, the Chairman of the Club (who was on annual leave) had personally been present throughout the day superintending the arrangements.

Miss Beaumont then read a letter which had been received from the Assistant Controller, Mr. Horace Dive, in which he conveyed to Miss Cox the best wishes of her male colleagues, and expressed disappointment that they had not been allowed to participate in the event.

A short musical programme followed, in which items were supplied by the following artistes:—Miss G. E. Berry, pianoforte solos; Miss A. E. Knapman, recitations; songs by the Misses B. Brotherwood and M. E. Gardner (Trunks).

The London Telephonists' Society.

One of the most interesting evenings of the session was held on Friday, Mar. 6, at the City of London Y.M.C.A. The occasion was the reading of the prize winning essays, and the final of the Elocution Competition.

The subject chosen this year for the essay was "What I might have been," and the large number of papers submitted demonstrated the desire, inherent in us all, to ponder the possibilities of life as we might have lived it.

The prize in the "Telephonist" class was awarded to Miss Myra E. Williams, of Grosvenor Exchange, whose paper was written in a strain which showed deep consideration of the metaphysical conditions governing life. It was read by Miss Williams in a wholly charming way that carried conviction.

Mr. D. G. H. Cox, of City Exchange, competed in the "Supervisors" class and gave great pleasure by his reading of a sincere and humorous paper full of human interest.

The third class, open to "Other Grades" produced entries from officers widely differing in rank, and after deliberation, it was decided by the paper's Committee of the Society that a prize should be awarded to each of the two competitors—Miss C. Morse, a girl probationer of Welbeck Exchange, and Mr. T. M. Oldham, of the Headquarters' Observation Section.

Miss Morse is a newcomer of promise, her paper was well written and read, and was full of the artlessness of youth.

Mr. Oldham is a writer of experience, and, as was to be expected, submitted a paper having marked literary merit, and one which, in the reading, gave scope to the personality of the writer.

The Elocution Competition had aroused wide interest; teams from all over London were entered by their respective exchanges. The finalists were the team sent in by Temple Bar Exchange, of which the members were Miss H. Cheason, Miss P. Mann, and Mr. H. Penn; and a composite team entered by Buckhurst Exchange, formed by Miss V. F. Woods of Buckhurst, Miss R. E. Poppleton, of Wanstead, and Miss V. Hankin, of Maryland. Miss Hankin, unfortunately, was unable to attend owing to illness.

The test poem was a sonnet by Siegfried Sassoon and the interpretations given were very varied. The judges, Mr. Horace Dive, Miss James, and Miss Reekie, awarded the trophy, a bronze-gilt statuette of Portia to the Buckhurst team. In addition to the trophy, the members of the winning team were each presented with a book of poems. Similar awards were made to Miss Symons, of Riverside Exchange, who obtained the highest percentage of marks in the eliminating trials, and to Miss Cheason, who gave the best individual rendering in the final. Miss Cheason's prize was the gift of the judges, and the Committee of the Society is appreciative of the interest shown by their act.

The prizes were presented by the Controller of the L.T.S., Mr. Napier, and, in response to a vote of thanks moved by Mr. Dive, the Controller, who was in humorous vein, spoke very warmly of the pleasure the evening had afforded him.

The final meetings of the Session will be held on April 9 and 10, when Mr. E. A. Pounds will produce Miss J. M. McMillan's Telephone Play, "Say it with Music." Our indebtedness to these officers for the enjoyment that their ingenuity and industry brings us will undoubtedly be again evidenced by the "Caste" playing to a full house.



L.T.S. CONTRACT OFFICERS' DINNER. [A Report of this function appeared on p. 134 of the March Journal.]

The L.T.S. and the League of Nations.

A Rally of the Exchanges and the L.T.S. (Controller's Office) Branch of the League of Nations Union was held at the Memorial Hall, Farringdon Street, on Mar. 2.

Miss A. Heap, I.S.O., formerly Superintendent of the Women Staff of the Exchanges, took the Chair and introduced the speakers, Professor Gilbert Murray and Lady Hall. An apology for non-attendance on account of the pressure of Parliamentary duties, was sent by Mr. S. P. Viant, M.P., the Assistant Postmaster-General.

Professor Murray said that it was a great pleasure to meet face to face people with whom he must often have had conversations over the telephone. Concerning his subject, Disarmament, he said that this was the foundation of the policy of the League of Nations, and he proceeded to point out why the Union is using all its energy to reduce armaments by international agreement.

The Great War, Professor Murray said, had taught us that war ruined both disputants and he quoted the truism "We must end War, or War will end us." Although the League of Nations was an actual fact, it could only be completely effective if the people were wholehearted in their support of the principle for which the League stood, and it was taking time to alter the manner of thinking of great masses of people.

"We have not disarmed," said Professor Murray, "in fact armaments have increased," therefore he pleaded for a policy of clearness and determination in order to give confidence to other nations. If nations were determined not to go to war, it would be easy to agree on the numbers of armaments. Confidence should be placed in the promise of the European countries to disarm, firstly because it is rare that a Treaty is broken, and when it does happen that a Treaty is broken, it is usually because it is so old that it has been forgotten, or because it is a secret treaty. The Covenant signed by the members of the League cannot be forgotten because the League meets once a year; everybody knows of the Covenant and discusses it, and any breach of it would be flagrant.

The difficulties of preventing war are very great, and will never be overcome unless there is a firm resolution, not only that we do not want war, but are prepared with a policy which insists upon peace, and the work of the Union is to foster this state of mind among the British people.

Professor Murray was followed by Lady Hall, who delivered an interesting speech on Slavery and Forced Labour.

Mr. H. G. Corner, in his appeal for funds and for supporters of the League of Nations Union, said how particularly appropriate it was that telephonists, who are being increasingly required for international service, should support an international league for the preservation of peace.

A vote of thanks to the speakers proposed by Sir Henry Bunbury and seconded by Miss A. Cox, the Superintendent of the Women of the Exchanges Staff, was warmly accorded.

A number of new members were enrolled at the meeting, and it is hoped that the membership of the Union will be still further increased in the immediate future.

Sanatorium Concert.

The second concert of the season provided by the funds collected in the L.T.S. was held at Benenden Sanatorium on Saturday, Feb. 21.

Commencing with community singing led by Mr. A. C. Vincent, who also undertook the arduous duties of accompanist for the party, the programme

went with a swing from beginning to end. There were 18 items on the programme, but by the time the conclusion was reached about 40 would be the correct score. This is sufficient to indicate the appreciation of the audience.

Miss Nellie Beare, soprano, was in her best form; her songs were rendered with charm, and her share in duets with Mr. Arthur Brough ("The Voyagers") and Mr. Hugh Williams ("The Miserere Scene") and also in the quartettes, contributed in no small measure to the success of those items. Miss Doris Purdie, contralto, a newcomer to these concerts, won the hearts of the audience by her earnest rendering of her songs.

Another newcomer to these affairs was Mr. Arthur Brough, baritone, who is becoming quite eminent as a broadcaster. He proved an acquisition to the party, and all are looking forward to hearing him again both at Benenden and by radio.

Mr. Charles Conyers, with his inseparable ventriloquial companion "Willie Winks," and Mr. Wilfred Tracey, provided the fun. These well-tried artistes know just the correct doses to administer to the patients and very successful they proved.

As usual, during the interval, the visitors distributed cigarettes, chocolates, &c., provided by the staff of the L.T.S. which were much appreciated by the audience.

The Medical Officer thanked the artistes in particular and the L.T.S. in general for providing such a high-class entertainment and said they were all eagerly looking forward to their next visit.

Miss Worth, in replying, announced that she was trying to arrange an "alfresco" Concert on June 27.

Personalia.

Resignations on account of Marriage.

Assistant Supervisor Class II.

Miss F. E. Wright, of Gerrard.

Telephonists.

Miss S. C. Page, of Gerrard.

" G. M. Jackson, of Tandem.

" E. G. Butler, of Toll "A."

" F. G. Fuller, of Trunk.

Miss E. M. Setterfield, of Royal.

" K. M. Bridger, of Holborn.

" D. M. Barber, of Western.

" E. K. Pringuer, of North.

FOR OUR ADVERTISERS.

ALL enquiries should be addressed to the Department of Overseas Trade, 35, Old Queen Street, London, S.W., quoting reference number in all cases. Supplies, &c., required by:—

New Zealand.—Wellington, P. and T. Dept., May 27. Supply of branch exchange telephone equipment. Ref. A.X. 10812. A confidential memorandum containing information as to methods of trading and terms of payment prevailing in Danish business circles, &c., prepared by the Commercial Secretary to the British Legation at Copenhagen. British firms desiring to obtain a copy of this memorandum should apply to the Department of Overseas Trade. Reference No. C.X. 3463.

J. J. T.

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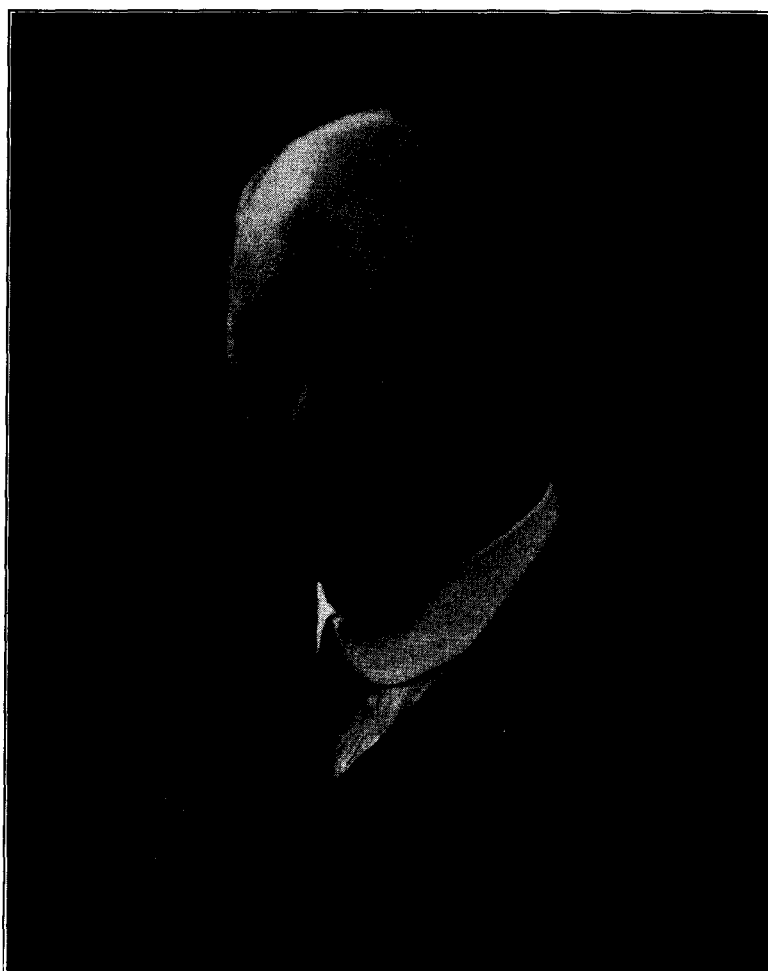
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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXXVI.

MR. O. G. LEE.

MR. O. G. LEE, whose portrait appears on this page, has been associated with two districts only in the course of his thirty-nine years in the Telephone Service, having transferred his activities from one of the principal English seaports (Liverpool) to another (Southampton). Mr. Lee was born in Manchester in 1872, and after spending part of his boyhood in the West Indies, was in the employ of the Electricity Supply Dept. of Liverpool for a short time before entering the service of the National Telephone Company in Liverpool in 1892 under the late Mr. R. H. Claxton. When Mr. Claxton was appointed North-Western Superintendent by the Company, Mr. Lee remained in the District Manager's office under Mr. A. Martin for some years, subsequently serving again under Mr. R. H. Claxton as chief clerk in the Provincial Superintendent's office. In



1904 he was appointed Contract Manager for the Liverpool District, a post which he retained on the acquisition of the Company's system by the Post Office. Development studies were a subject in which Mr. Lee had always taken a special interest, and when he served as a member of a special committee on the subject in 1925, he submitted to the committee a scheme of development studies which had been tried in Liverpool and, with the necessary modifications, was practically adopted for the whole country. In the December of that year, Mr. Lee was appointed District Manager of Southampton, at that time graded as a third-class district, but now ranking as a second-class one with hopes of shortly becoming first-class. During Mr. Lee's District Managership the number of telephones in the Southampton District has increased from 29,000 to 49,000, and many developments have taken place there which we have not space to recount in this short article. Mr. Lee's favourite recreations are a book and the open road, whether afoot or on cycle.

[Photograph by Jas. Bacon & Sons, Liverpool.]

section. It was unkind of him to report that 85% of the errors in the calling of numbers are the subscribers' own fault, with only 15% attributable to operators. Everybody who uses a telephone knows that the operator is always to blame.

He was a bit ruthless, too, in disclosing the fact that virtually half of the persons who call "information" for numbers have neglected to look in the telephone directory for the desired number. This exposes a pet habit of large numbers of our more easily exhausted residents, who cannot be bothered with looking through a directory.

"Mr. Boylan had something to report about persons who engage in endless conversations over party lines, those who try to recall numbers by memory and denounce the operator when she gives them the wrong party, those who persistently transpose numbers or give the wrong exchange, and those who slow up service by refusing to answer their telephones. Without actually accusing the public of anything, he seemed to intimate that if it wasn't for the public, the telephone service would be a pretty efficient enterprise. And the worst of it is, he is probably right."

According to the *Electrical Review*, the Anglo-Portuguese Telephone Co., Ltd., initiated the conversion of Lisbon's telephones to automatic working last year. A new exchange was installed in the Trindade building with a total capacity of 8,500 subscribers' lines, and two old exchanges were closed down, 6,613 subscribers being changed over to automatic service. The whole of the work, on which over £100,000 was expended, was carried out in the record time of eight months. All of the plant installed was either of British or local manufacture. The principal contractors were Siemens Bros., Ltd., of Woolwich, and for the underground cables British Insulated Cables, Ltd. The new service will be extended to cover the whole of the city, and the company also proposes to spend another £150,000 on extending its system this year.

An official report on the French Telephone Service for 1929 shews that, taking the whole country, the number of telephones per 100 inhabitants increased from 2.36 to 2.59; Paris led with 12.92 instruments per 100 of the population, Dunkirk being second with 8.13, followed by Strasburg 7.66, Nice 7.04, and Bordeaux 6.33.

A paragraphist in the *Birmingham Daily Mail* commenting on a Post Office circular, says airily, "It boasts that there are now nearly two million subscribers in the United Kingdom—about half the total of subscribers in New York, I suppose."

It makes us a little tired to see such ill-informed guessing printed in a responsible paper. If a pressman wrote: "You can travel by express train from Berlin to Cologne in seven hours—about half the time it takes to get from London to Newcastle, I suppose," dozens of correspondents would write to the Editor to point out the absurdity of the statement.

A writer in the *South Wales Argus* (Mr. A. M. Thompson) puts very clearly some well known arguments on the subject of telephone development which are generally lost sight of by our critics.

"Comparison," he says, "between a crowded country like England, and countries like those with which opponents of our national service contrast its use, fails to take notice of the great difference between our conditions and those of, for example, Canada, and U.S.A. In these great countries of wide open spaces, where women are women, and villages are villages, the miles apart are hundreds.

In Great Britain the majority of housewives have shops within easy walking distance, and tradesmen send round for orders. But in the countries with which Great Britain is compared by people who advocate the substitution of private for public enterprise in the Post Office, the population outside the town is widely scattered, and the telephone becomes a toil-and-time-saving necessity of existence."

LONG DISTANCE TELEPHONY.

J. F. DARBY (*Headquarters Traffic Section*).

(VI.)

IN continuing the treatment of the subject of American, 'combined line and recording' operating, questions of control signalling and supervising call for consideration.

In the first place, it should be stated that the trunk exchange (originating trunk centre) which first receives a long-distance demand, controls the call, no matter what distance or number of switchings is involved. (An exception to this is made, to some extent, in the case of transoceanic calls where the connexion is set up by the international *tete-de-ligne*—New York. The *chargeable* ticket is, however, held at the *originating* trunk centre and, when the call is reversed by New York, the connexion is set up via the 'New York' control position at the originating trunk centre. New York advises the latter of the charge to be inserted on the ticket. In some degree, therefore, the originating trunk centre exercises control on an overseas connexion.)

To make a comparison with the British system, Group Centres, such as Guildford and Canterbury, would control calls to any point in the British inland system. To devolve, to the Group Centres, the control of calls to places outside the British Isles would not be practicable, owing to the difficulties which arise in the use of foreign languages for operating and telephone conversations. It may, however, be practicable, as the demand system is developed in Great Britain, to provide for the operator at the 'London' position of the originating trunk centre to hold the trunk ticket by which the charge is levied. The control of a connexion at the originating trunk centre has, apart from the advantage mentioned in an earlier article, viz., giving easy access from the caller to the controlling telephonist in the case of difficulties or enquiries, the outstanding merit of providing through signalling from the calling subscriber's switch-hook to the controlling operator's position (supervisory lamp on answering cord). At the distant end of a trunk connexion, connexions are set up from the terminal trunk exchange via B positions of local exchanges or their equivalent over cord circuits with through signalling facilities and, in consequence, through signalling is normally given from the *called* subscriber's switch-hook to the terminal trunk operator (supervisory lamp on calling cord).

As regards the signalling over trunk circuits themselves, generator calling and clearing is uniformly in operation. The circuit arrangements are such that the actuation of a ringing key on an outward position locks up a relay and lights a calling signal at the incoming end—a steady glow being given. The recall of an operator can be effected over a trunk circuit by re-ringing on the line. In this case, a relay is actuated which causes the supervisory signal on the answering cord at the incoming end to flash; the incoming operator then enters the circuit.

When the subscribers replace their receivers at the end of conversation, the normal condition on a *direct* call is that the controlling operator (originating trunk centre) receives a clearing signal from the calling subscriber and the terminal trunk operator receives a 'clear' from the called subscriber. The controlling operator disconnects without challenging, while the incoming trunk operator disconnects after challenging on the circuit. To enable supervision to be efficiently carried out, high impedance monitoring facilities are provided on all trunk operating positions. (The present standard in the British system is to provide a *master* monitoring key per position. Under the American system, a monitoring key is provided on each cord circuit.) These monitoring facilities play an important part in the setting up of indirect and multi-switched connexions; this matter will be touched upon later.

Timing is carried out, normally, by means of veeder clocks or calculagraphs and a high degree of accuracy is attained. On long distance calls the service observations show that the durations, recorded on the tickets, and the actual durations vary by only 5%.

So far, the description of the American system has been confined to the direct type of call over a simple arrangement of 'trunking' between the trunk and local exchanges. It has, perhaps, however, enabled readers to visualise the set up and operating involved in handling straightforward calls under this system. It must, of course, be realised that, in actual practice, the simpler type of traffic forms a large portion of the total transactions of any telephone system and, in introducing the demand system in Great Britain, the initial stages will embrace only the simpler traffic, with the 'trunking' arrangements on the lines indicated in Article No. (V). When these arrangements have matured and experience has been gained as regards operating procedure, loads, equipment, and the reaction of the public to the new methods, the scheme will be extended to embrace the smaller trunk centres and multi-switched traffic.

In order that some idea may be formed of the operating and equipment arrangements involved in the case of indirect calls, an outline is given below of a 'set up' of a *trunk to trunk* connexion via an intermediate trunk exchange.

The outward operator at the originating trunk centre (O.T.C.) receiving a demand which involves an indirect routing, ascertains from her switchboard schedule the correct routing and selects, if an idle circuit is available, a channel to the intermediate trunk centre (I.T.C.); she asks the inward operator at that exchange for the terminal trunk centre (T.T.C.). The connexions are indicated in Fig. 1, condition (A). The operator at the I.T.C. transfers the call to a 'through' position at the I.T.C. by one of the methods mentioned in Article No. (V). The O.T.C. again passes the demand (this time to the 'through' position operator at the I.T.C.) for the T.T.C. The I.T.C. operator makes connexion, if a circuit is available, to the T.T.C. and rings. The O.T.C. then passes the number of the called subscriber to the T.T.C. inward operator. The connexions are indicated in Fig. 1, condition (B). It is interesting to note that the 'through' position operator at the I.T.C. is required to give *high impedance monitoring* on the connexion until she hears the O.T.C. speak to the T.T.C. An important

C.S.3) as in the case of a direct 'set up.' In addition, the O.T.C. rings on the trunk circuit to the I.T.C. and, thereby, gives the latter a flashing signal (C.S.2) on the supervisory lamp of the answering cord; the I.T.C. is then instructed by the O.T.C. to take down the connexion. To meet cases where a 'no circuit available' condition is encountered when the I.T.C. endeavours to make connexion to the T.T.C., the regulations provide for the trunk circuit between the O.T.C. and the I.T.C. to be held by the latter for 5 minutes while efforts are made to obtain a disengaged circuit to the T.T.C.

When calls are routed via two intermediate trunk centres they are termed 'multi-switch.' The connexions are set up on lines similar to the above-mentioned procedure, except that all demands are passed forward with the prefix 'multi-switch.' An important point of operating in connexion with such calls is that the operator at *each intermediate trunk centre* is required to give continuous high impedance monitoring on the circuit until the calling and called subscribers are heard to be in conversation.

A point which naturally arises in connexion with the trunking arrangements indicated in the previous article—No. (V)—is the question of the extent to which separate circuits in a telephone network are provided for demand trunk working, and the extent to which line plant is common to both no-delay and demand services. In the case of areas around the main trunk centres, the problem is comparatively simple, the traffic being sufficiently heavy to admit of separate groups of circuits to serve minor and local exchanges for the various classes of connexions concerned. The groups concerned are:—

- (a) Junctions and 'no-delay' trunks;
- (b)—(i) record circuits to serve manual exchanges;
(ii) recording and completing circuits to serve automatic exchanges;
- (c) trunk junctions for reversing originating and completing incoming trunk calls operated on a demand or delay basis.

Where, however, the trunk exchange is small and also where a local exchange is very remote from its trunk centre, some complications arise owing to the difficulty in providing separate circuits of each class referred to above. In consequence, arrangements have to be made as best may meet the particular

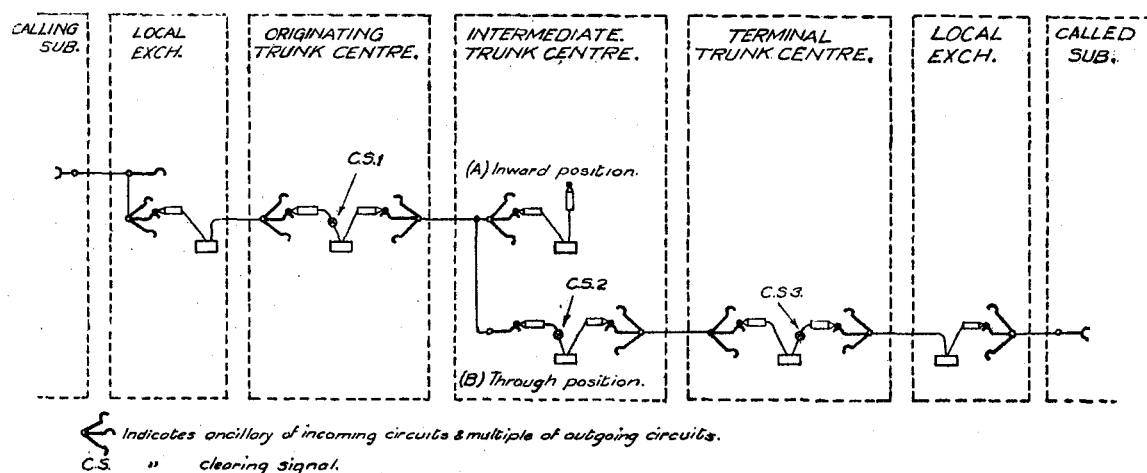


FIG. 1.

point in connexion with the setting up of trunk to trunk connexions in America is that internal transfer circuits are not normally used, but connexion is made direct between the incoming termination of one trunk circuit and the outgoing multiple of the other trunk circuit. Such arrangements are in force on the transoceanic position in London, but the use of transfer circuits is common practice for connecting two inland trunk (delay basis) circuits.

As regards breaking down the connexion at the conclusion of conversation, the O.T.C. and T.T.C. receive 'clears' from the calling and called subscribers respectively (see Fig. 1, C.S.1 and

circumstances, having due regard to line plant economy and the provision of an efficient trunk service. Fig. 2 gives a number of examples which may be regarded as typical of the means adopted in the circumstances indicated below.

The diagram marked A represents an exchange with sufficient traffic to admit of the provision of separate record and trunk junction circuits. The exchange has, in addition, a further group of circuits for the disposal of no-delay traffic.

Diagram B represents an exchange which has less trunk (demand basis) traffic than exchange A, and separate record

circuits are not warranted. Connexion with the outward trunk (demand) positions is obtained via another local exchange or a central local tandem board. Direct circuits are, however, provided from the trunk exchange for reversing originating and completing incoming trunk calls.

Diagram C represents a remote exchange served by generator signalling circuits. Two both-way groups are

all calls from the minor exchange are controlled by the demand operator.

A few words might be added regarding developments in automatic areas. Although it is the common practice in the United States for a special code to be dialled for long-distance calls, the 'single channel' method of working is now being rapidly introduced; under this arrangement subscribers are required to dial 0, not only for no-delay trunk calls, but also for 'station to station'

TYPICAL TRUNKING ARRANGEMENTS BETWEEN MINOR EXCHANGES AND TRUNK CENTRES

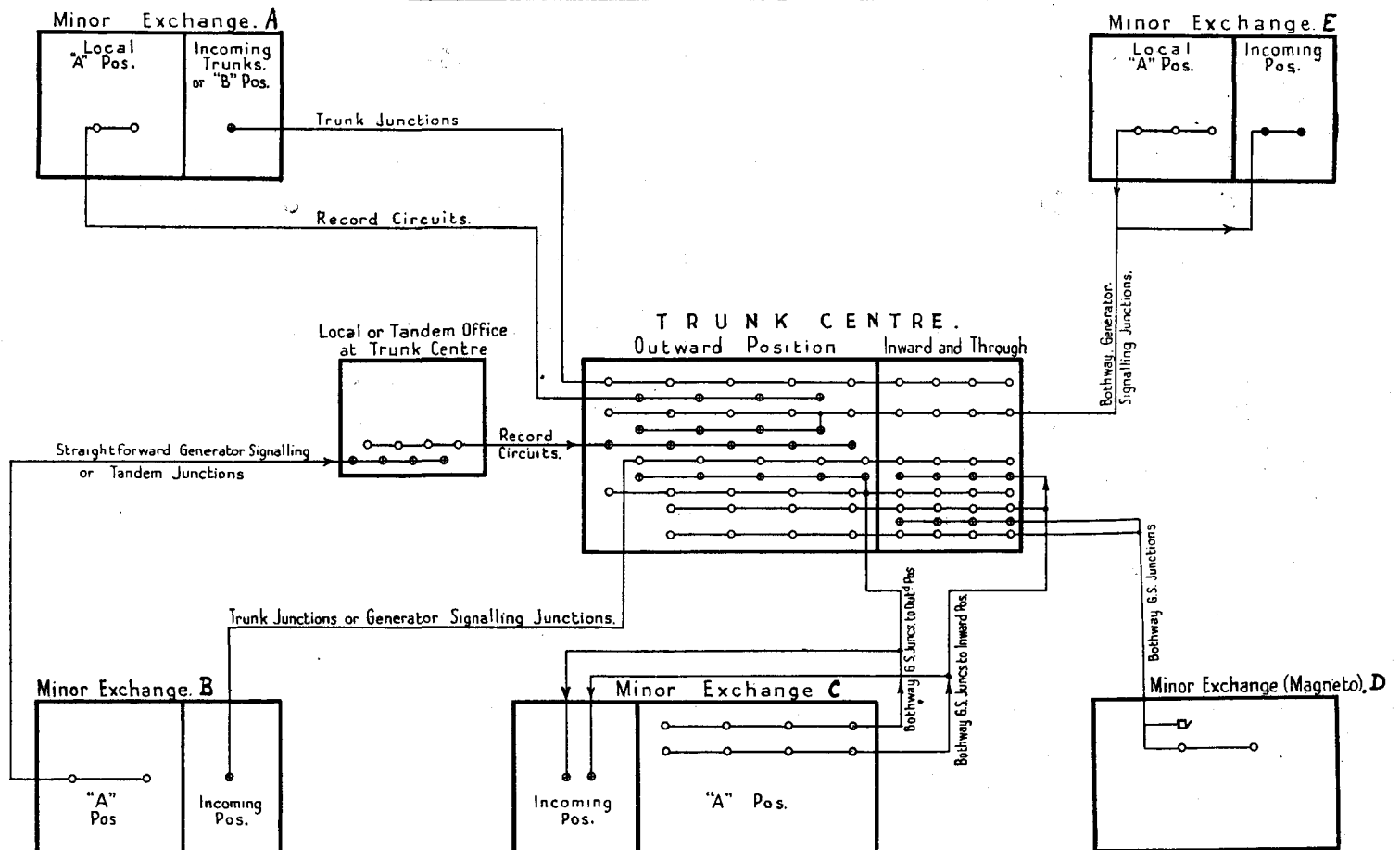


FIG. 2

provided, one for the disposal of trunk (demand basis) traffic and the other for no-delay traffic. The trunk calls are not reversed and signalling is not available from the calling subscriber's switch-hook to the controlling operator's position.

Diagram D represents a minor exchange with a single group of both-way junctions. It controls junction and no-delay trunk calls and, as these predominate in number over the trunk (demand basis) calls, the circuits are terminated on inward positions at the trunk centre. When a trunk (demand basis) call is required the minor exchange asks the inward operator at the trunk centre for a demand position operator. The B operator at the trunk centre, speaking over an inter-position junction, instructs the demand operator to pick up the circuit on which the minor exchange is held. The demand operator then deals with the call in a normal manner, except that the call is not reversed and no clearing signal is received from the calling subscriber.

Diagram E represents a minor exchange with a single group of both-way circuits. It does not exercise any control on junction or no-delay traffic as in case D above and the incoming ends of both-way circuits are, therefore, terminated on demand positions at the trunk centre. On these positions

(non-personal) long distance calls. In such cases, the auto-manual board operators control the long distance station to station calls and obtain access to the long distance trunk network via a trunk tandem board at the trunk centre. (For personal calls, subscribers are required to dial a special code and they are then connected automatically to demand positions at the trunk centre.) To meet cases where it is necessary to connect a subscriber calling on an auto-manual board—0 level circuit—to a position in the trunk exchange for control of the call at trunk centre, the cord circuits on the auto-manual boards are so arranged that they are normally non-through signalling, except when a connexion is extended to the trunk demand position, when the cord circuits give through signalling conditions from the subscriber's switchboard to the trunk exchange.

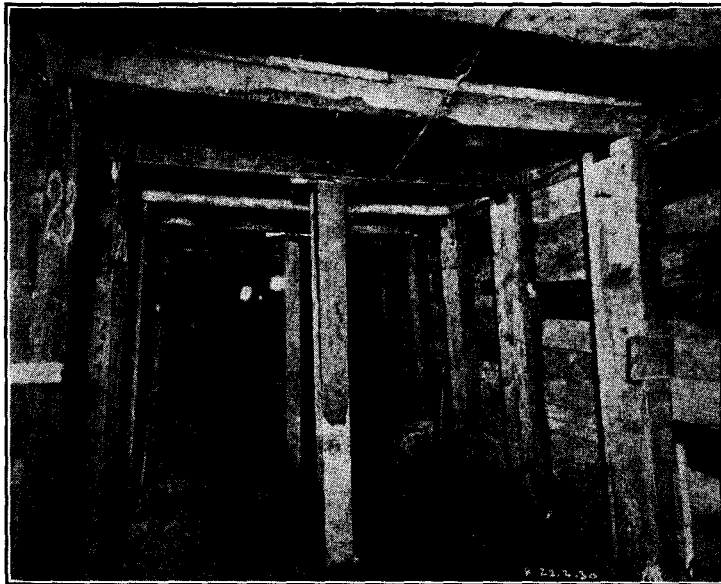
It has already been indicated that in introducing demand working in the British system, the arrangements to be made in automatic areas will probably involve the use of a separate dialling code for long distance connexions. It seems likely that the code 94 will continue to be used in non-director areas, although, at the moment, certain difficulties arise in connexion with the upgrading of the existing trunking scheme to a higher transmission level. In the case of Director automatic areas the code TRU will, of course, be suitable.

(To be continued.)

MAYFAIR.

BY A. J. ALLISON.

MAYFAIR, that fashionable residential quarter of London where the great ones of the past dwelt and still linger in the spirit, is being invaded stealthily by the demon of Progress, whose temple is now beginning to rear its head in Farm Street, a quiet backwater of this aristocratic neighbourhood. Perhaps stealthily is hardly



MAYFAIR—SUBWAY UNDER MOUNT STREET GARDENS.

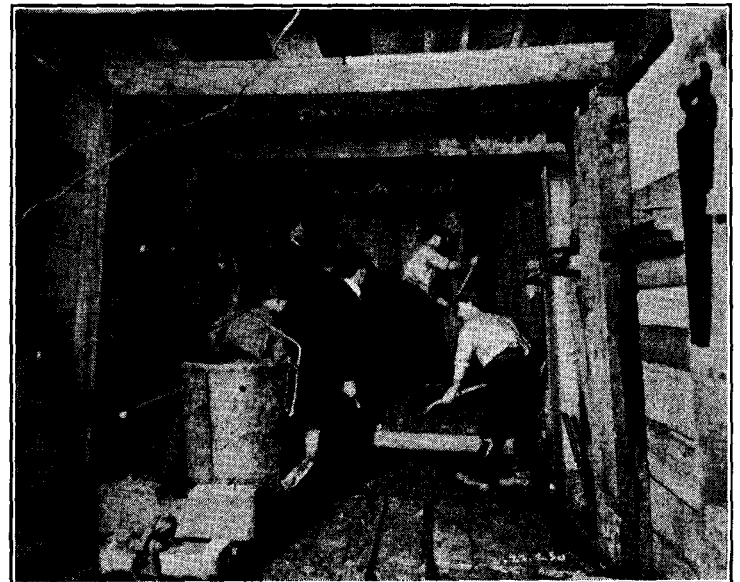
a fitting description, for the erection of this new telephone building, as it moves relentlessly towards completion, is accompanied by all the clatter and multifarious activities of modern building operations.

This structure will house the latest marvel of the conversion to Director Automatic working of the Telephone system of London, which began with Holborn in 1927 and will not cease until the conquest of the Metropolis is complete. Automatic telephony, and more particularly as applied in the Director system, is a mass of controlled and co-ordinated complexity that has been described as "the high-water mark of human creative power." The new building will occupy a unique position even in this system, inasmuch as it will be the home of four telephone exchanges that exist in their present manual state as separate entities, although one of this number will be but a temporary tenant pending the preparation of its permanent automatic home. The exchanges thus accommodated will be Mayfair, Regent, Grosvenor, and, temporarily, Langham, and these necessitate the provision of three full automatic units, the capacity therefore being 30,000 lines. Without entering too deeply in the present article into the technical arrangements that have to be made for this new automatic Colossus, it can be said that the identity of each exchange will be preserved as regards subscribers' numbering and in facilities to the auto-manual board, the latter feature involving not a little technical complexity. A large proportion of the common apparatus will, however, be available for joint use by the subscribers of all four exchanges, and this will enable some economy in space and plant to be effected.

The provision of this quadruple exchange is a realisation of a plan made some years ago, when shortly after the war it became urgently necessary to provide relief to the Mayfair Exchange, owing to abnormal growth. This was achieved by the establishment of relief exchanges in the area under the names of Grosvenor and Langham. At the same time investigations were undertaken to

determine the most economical method of catering for the ultimate requirements of the original area served by Mayfair. The scheme which was finally adopted provided for the establishment of a large telephone building in the southern portion of this district. This arrangement rendered practicable the conversion to automatic working of Mayfair and its relief exchanges by transfer to the new building. It also facilitated the task of demolition and reconstruction of the present building housing Gerrard and Regent Exchanges, by establishing a Regent automatic unit in the new building and thus reducing the number of lines in the Gerrard premises. Accordingly the freehold site in Farm Street was purchased in March, 1927, and the scheme is now moving swiftly towards consummation.

The new exchange building is flanked on one side by the "Punch Bowl," an inn whose premises were converted from a stable some 200 years old. There still remain evidences of the former use of the premises. On the other side is the Farm Street Jesuit Church, which is a Gothic type structure by J. J. Scoles, built in 1848. There are many interesting points about this church which has for its front elevation a miniature reproduction of Beauvais Cathedral. It was the first church possessed by the Jesuits after their expulsion from Somerset House, where they were originally allowed by King James I. As opposed to usual practice, the church is built at such an angle as to have the congregation facing north. There are no windows in the ordinary sense, as the church is hemmed in by buildings on both sides, and light is obtained from a clerestory, giving an unusually dim appearance to the interior. It was necessary when excavating for the foundations of the new building to underpin the church; this proved a slow process and has delayed the completion date.



ANOTHER VIEW OF THE SUBWAY.

The land at the rear and side of the exchange building is an old burial ground, now known as Mount Street Gardens and open to the public. It was deemed to be most advantageous to feed the cables serving the exchanges from Mount Street across these Gardens, but when permission was sought for excavation to lay the necessary ducts, it was refused on account of the former use of the soil. It was finally decided to construct a subway some 16 feet below the surface to enable the cables to be brought in, but Parliamentary sanction had first to be obtained before this course could be adopted. The subway has an internal width and depth of approximately 6 feet, and runs directly from the exchange to the manhole in Mount Street.

The distance between these two points is approximately 200 feet, and tunnelling had to be resorted to for about two-thirds of this length in order to overcome the objection previously referred

to. The construction was carried out by Messrs. Mowlem, and an idea of the work involved may be gained from the photographs of the subway during the progress of building. The roof is constructed of reinforced pre-cast concrete slabs, which are rendered with waterproof cement plaster. The subway slopes steeply down from the manhole to the portion that has been tunnelled and at the exchange end the ascent is steadily made to the cable chamber. Steps are provided at the inclines to permit an easy walking path. The subway is to be lit with the bulkhead type of lamp and jack points are provided for the use of extension leads as required.

The district that will be served by these exchanges is full of interesting and historical memories. It may not be generally known that the name "Mayfair" derives from a fair held in spring for many centuries on the site now occupied by Hertford Street, Curzon Street, and Shepherd's Market. It was suppressed in the reign of George III because of the riotous reputation it acquired. The "Dog and Duck" was closely associated with the fair, the pond being used for duck baiting, and it was this pastime which gave its name to the hostelry and also to a street known as Ducking Pond Mews. Shepherd's Market is named after the architect of Crewe House nearby, and this market retains much of the flavour of a quaint village, with its old-fashioned shops and cobbled streets.

The title of Mount Street is obtained from Oliver's Mount, a great earth mound which formerly stood where now are Grosvenor Square Gardens. Oliver's Mount was a redoubt thrown up hurriedly by rebel citizens when Charles I was marching on London from the Royalist victory at Edgehill in 1642.

Berkeley Square, hard by the new exchange building, teems with old memories. The houses at the southern end were erected on the site of Hay Hill Farm, which took its name from the Eye or Aye Brook which formerly ran its course across the land that is now the gardens of Lansdowne House. It is probable that Farm Street derives from the former Hay Hill Farm. It was here, in the year 1554, that Sir Thomas Wyatt and his Kentish followers in the rebellion attempting to displace Mary from the throne in favour of her half-sister Elizabeth, were engaged by the Queen's forces and heavily defeated. Wyatt surrendered at Ludgate and was sent to the block, and Elizabeth herself narrowly escaped a like fate owing to her hold on public affection.

Much more might easily be recounted of the romantic lore attaching to this district, but it will suffice to say that it has associations as many and as varied as could well be found in any other locality of London.

It is anticipated that the new telephone building will be ready for the installation of equipment to commence in September of this year. The contract has been placed in the hands of the Automatic Telephone Manufacturing Company of Liverpool. It is interesting to note that the specification provides for selectors of the 200-outlet type throughout. The apparatus that will be common to all the exchanges includes A Digit Selectors, Directors, Relay Sets and Codes for Call Indicator working, 3rd Code Selectors and a preponderating proportion of 2nd Code Selectors. It is proposed to give further articles on the technical aspects at a later stage in the development of these exchanges.

REVIEWS.

"The Theory and Practice of Radio Frequency Measurements."
By E. B. Moullin, M.A., A.M.I.E.E., M.I., Rad. Eng. Second Edition. Published by Charles Griffin & Co. xii + 487 pp. Price 34s. net.

Since the first edition of this book was published five years ago the scope of radio-frequency measurements has grown enormously. In the present edition the book is almost double its former size and has been practically entirely re-written.

The whole ground of radio-frequency measurements is fully covered. A chapter has been added dealing with the mathematical theory of the electric field in the neighbourhood of circuits and aerials carrying high frequency currents. The section dealing with the valve generator has been much enlarged, and contains a very complete discussion of the conditions for oscillations to occur in various forms of generator. The other chapters deal with the measurement of potential difference, current, resistance, capacity and inductance, the measurement of frequency, of antenna characteristics and of the intensity of radiated fields. The book concludes with a chapter dealing with miscellaneous measurements such as the harmonics of a valve generator, the efficiency of valve amplifiers and the determination at the receiving station of the modulation of acoustic signals.

The whole subject is dealt with exhaustively, and the book should be of very great use not only to those who are actually concerned professionally with radio-frequency measurements, but by reason of the thorough manner in which the mathematical theory has been developed, to all advanced students of high frequency electrical work.

"Die Entwicklung des Fernmeldewesens für den öffentlichen Verkehr (Ein geschichtlicher Überblick) Teil. 1. Telegraphie. Von Artur Kunert, Ministerialrat im Reichspostministerium."

Multum in parvo this little octavo volume of less than 300 pages could certainly well claim as its motto. Herr Kunert is well known to the engineering and commercial side of our own Post Office. This big, little book, which gives "an historical glance" at telegraphy, forms part of a series of works printed under the authority of the Reichspost with the wider title of "The Development of Distant Communication for Public Traffic." It is exactly the precise, well-ordered volume that one would expect from the pen of this very careful compiler of facts.

Commencing *circa* 2000 B.C. the author takes us to the Chinese, with their knowledge of the magnetic compass, thence to 1184 B.C., when, at the fall of Troy, bonfire telegraphy was used. On to 558 B.C., when it is known that the Persians used the "Rufpost," by means of slaves specially selected for their strong voices. These were positioned on wooden towers spaced out at considerable distances. By this means a message could be delivered over a distance of 30 days' journey in 24 hours. Thence we travel to 360 B.C., with the hydraulic telegraph of Arneus, and then on and on through names and dates and succinct descriptions, and ample references concerning the men and the machines and telegraph systems they built, right up to Feb. 28 1931, when the book concludes with the closing down of the Indo-European long-distance circuit. In addition to the actual subject matter there are two reference tables, in addition to the usual Inhaltsübersicht, one chronological, and the other of names and subjects. Two pages are devoted to the Useful Sources (Benutze Quellen) from which the author obtained some of his data.

Among the British references one notes Charles Bright on "Submarine Telegraphs," 1898; F. J. Brown "The Cable and Wireless Communications of the World," and *Telegraph and Telephone Journal*, Volumes 14 to 17 inclusive, containing Harry G. Sellars' "Brief Chronology." The reviewer has checked the contents here and there, and so far has been unable to find any serious omission. Even the conversion of the P.O. Standard relay into a Vibration relay by Mr. E. Lack, now retired from the E.-in-C. Department, is not omitted from this very valuable work of reference. To say that no telegraph library would be complete without it may seem trite, but it is in this case also true. The price of this particularly well-printed work is 8s., and may be obtained from R. Von Decker's Verlag, Linkstrasse, Berlin, W.9.

J. J. T.

THE ENGINEERING AND TRAFFIC ASPECTS OF TELEPRINTER DEVELOPMENT.*

By A. P. OGILVIE (*Headquarters Traffic, Secretary's Office*) AND
F. W. DOPSON (*Engineer-in-Chief's Office*).

SECTION I.

It is, I think, within the knowledge of most of you that during the past few years the telegraph system of this country has been undergoing considerable change, both as regards Engineering and Traffic technique. The extent and the far-reaching effect of the development—which, by the way, is still taking place—is at present, however, probably apparent only to those in daily touch with telegraph matters. An attempt is therefore being made in the following paper to give some idea, necessarily brief, of the type of apparatus that is being installed and the general effect of its adoption on the telegraph service as a whole.

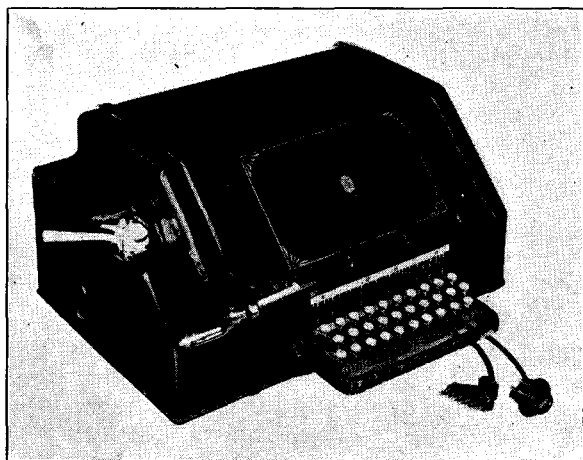


FIG. 1.

The reorganisation now being undertaken has been rendered possible by the advent of the extremely efficient start-stop telegraph printing machine, of which the various models in use are officially classified under the general title of Teleprinter.

By start-stop is meant printing telegraph instruments where the transmitting and receiving shafts are normally at rest, in contradistinction to other types where the shafts are continuously in motion.

The first start-stop machines introduced into this country were of American manufacture and were known formerly by their trade name of Teletype. Two different models were designed and were given the official titles of Teleprinter 1A and 2A, but during 1927 a machine of entirely British manufacture, and now known as the Teleprinter 3A, made its appearance, and this has been adopted as the standard instrument. Since 1928 up to the present time, approximately 1,600 Teleprinters 3A have been delivered to the British Post Office. These machines have been used to replace existing apparatus on inland circuits, as fast as they could be obtained from the manufacturers.

The transmitting portion of the Teleprinter consists of a typewriter keyboard, but instead of a type bar being directly operated when a key is depressed, a number of electrical impulses are sent over a circuit. These operate an electromagnet mounted on the base of the machine at the distant end, and bring about mechanical movements which result in a character being printed on a paper tape. As each letter is printed, the tape is fed forward, and after passing out through an aperture in the cover of the machine the tape is gummed on to a telegraph form.

From the foregoing it will be seen that the machine consists of a receiving unit in addition to the keyboard transmitter. Both of these are mounted on the same base, and the revolving mechanism of each is driven by one and the same motor. Duplex operation—where messages are sent simultaneously in opposite directions over the same wire—can be employed, thus the keyboard may be operated, if necessary, quite independently of the receiving mechanism.

Photographs of the Teleprinter 3A are given in Figs. 1 and 2, the former showing the instrument with its cover in position, while the latter gives a general view of the operating mechanism. The keyboard can be clearly seen in both cases, also the connecting cords and plugs provided to facilitate rapid replacement when necessary. The receiving electromagnet is shown in the lower photograph mounted directly in front of the motor. The five-unit Murray code is used, that is to say, each character signalled is differentiated from the other, by various combinations of five equal marking and spacing currents—a marking current being negative and a spacing current positive. Every character combination when transmitted is preceded by a start signal in a spacing direction and terminated by a stop signal in a marking direction.

Although a description of the mechanical movements involved is not particularly called for within the scope of to-night's paper, a strong wish has been expressed that a brief description of the essential operations should be included, and Fig. 3, therefore, shows the main portion of the transmitter unit.

The Combination Bars correspond to the five units of the signalling code and each bar has a number of projections cut on its upper edge, although only three are indicated. Under the tension of springs the combination bars tend to slide to the right, but such movement is prevented normally by means of the Reset Lever, the upper end of which rests on a special cam of the transmitting cam sleeve. The latter makes one revolution when a key bar is operated, and as the cam sleeve commences to revolve the combination bars are released, so that they can be moved by their springs towards the right. Some of the combination bars, however, may have projections immediately on the left of the depressed key bar, and the three which are shown occupy this position. As a result, the projections bank against the upper portion of the keybar, and the combination bars on which they occur are thus prevented from moving. In this way some of the vertical extensions fitted to the combination bars remain beneath their associated selecting levers, while the remainder are withdrawn.

The hump on the upper portion of each selecting lever rests in a corresponding cam track, and each of these tracks is provided with a slot. When the cam sleeve is at rest, the hump on the horizontal portion of the start-stop lever actually lies in the slot of its associated cam, while the lower end holds the contact lever so that the transmitting tongue is against the contact screw M, and a permanent marking current flows to line. The start-stop lever, it will be noticed, has no combination bar associated with it. When the cam sleeve commences to revolve, the upper portion of this lever rises as the hump rides out of the slot, the contact level is pulled back by its spring, and the transmitting tongue is lifted to the contact screw S. The spacing current thus sent out forms the start signal. The slots in the other cam tracks then pass one after the other in definite sequence, 1, 2, 3, 4 and 5, beneath the humps of the remaining selecting levers. These either drop into the slots or are prevented from doing so, according to whether the corresponding combination bars are withdrawn or not.

In this way the transmitting tongue moves up and down between S and M, and a combination of negative and positive currents are sent to line. The start-stop lever drops into its cam slot just before the cam sleeve completes one revolution, the marking current sent out as a result forming the stop signal. This marking current actually continues until the next key is depressed.

Fig. 4 shows the selecting mechanism of the receiver unit, which consists essentially of five combination combs or discs, each having a number of slots and projections arranged around its circumference. Fitted to each comb is a short, horizontal extension, and adjacent to these are five selecting fingers, all of which are capable of individual movement to a position immediately beneath the corresponding comb extension.

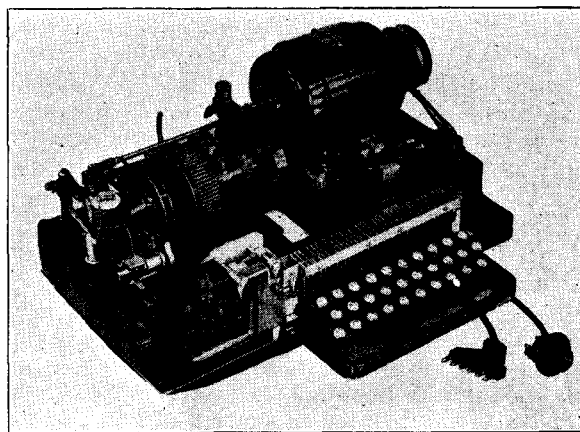


FIG. 2.

In front of No. 3 selecting finger is a striker pin carried by means of a traversing link, and in the same horizontal plane is a flat steel blade known as the striker blade. The latter is supported by two split brackets fitted to a trip shaft, which is mounted in bearings at each end. The trip shaft is capable of being rotated slightly by means of a link, the other end of which is attached to the receiving electromagnet armature. The armature normally lies against the limiting stop M, but when the spacing start signal is received from the transmitter, it moves to S, and turns the trip shaft slightly so that the striker blade is tilted downwards. The movement of the trip shaft causes the cam sleeve shown to revolve, through the medium of mechanism which has not been included on account of clearness. One of the cam sleeve tracks moves the traversing link endwise and it carries the striker pin from in front of the third selecting finger to a position in front of the first. Just before the pin reaches this position, the first code impulse of the character being transmitted is received. If the impulse is "marking," the electromagnet armature moves back to M and turns the trip shaft in the reverse direction to its former movement, and this raises the striker blade to horizontal. On the other hand, if the impulse is the same as the start signal, that is "spacing," the

* Paper read before the Telephone and Telegraph Society of London.

electromagnet armature continues to lie against S, and the striker blade remains tilted downwards.

As the striker pin comes in front of the first selecting finger, the striker blade operated by one of the cams moves sharply towards the combination combs and back. If in the raised position, the striker blade pushes the pin through the traversing link, causing it to move the first selector finger forward beneath the horizontal extension of No. 1 combination comb. If, however, the striker blade when it moves forward, is in its lower position it passes beneath the pin and the selecting finger is not operated.

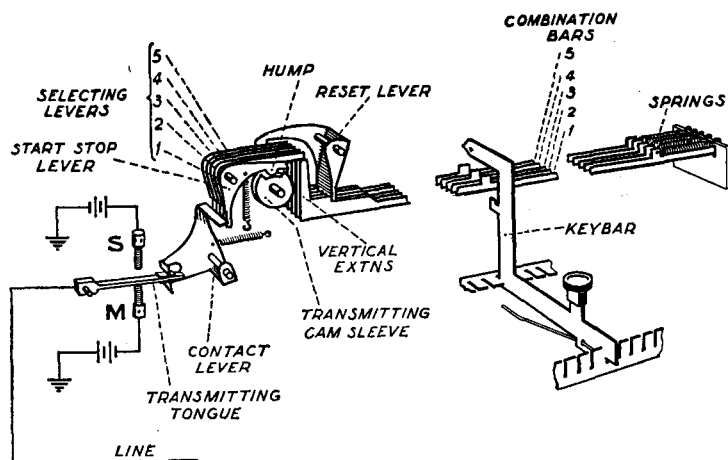


FIG. 3.

The striker pin is then moved back by the traversing link and carried successively in front of the other fingers. As it passes each one, the striker blade is operated, the selector fingers either being pushed forward or not according to whether the incoming signalling impulses are spacing or marking.

When selection has thus been set up on the fingers, they are all raised simultaneously by means of a comb setting lever, operated by one of the cam tracks. Those fingers which have been pushed forward lift the corresponding combination comb extensions, and cause those particular combs to rotate slightly.

As they are thus positioned, one of a number of bell crank latches, which are in position around the circular combs, drops into an aligned set of slots, at a point depending upon whatever code combination is received.

Passing through the centre of the combs is a continuously rotating spindle which causes a typehead to revolve through the medium of a friction clutch. When a bellcrank latch falls into the groove of slots in the combination combs, its end drops into the path of a stop arm fitted to the revolving typehead spindle. The stop arm thus strikes the end of the latch, and arrests the motion of the typehead, with the particular typebar required, lying immediately in front of a printing hammer, which is not actually shown. The printing of the character takes place during the next selection.

That very briefly describes the main mechanical operations of the Teleprinter 3A.

Since the first installation of the machine just described experience has indicated several directions in which modifications could be undertaken with advantage.

Of the changes which are at present under consideration the following are perhaps the most important:—

- (1) The provision of an automatic cut-out which will cause the motor to stop after an idle line period of about 60 seconds, thus saving wear and tear.
- (2) The adoption of higher resistance electromagnet coils.
- (3) The provision of a bell unit so that an audible warning can be given when required.
- (4) A device for transmitting a succession of the same character by one depression of a key. This will be useful for adjusting purposes.
- (5) The elimination of an escapement mechanism known as a mechanical relay which is fitted on most machines. This, it is hoped, will materially reduce maintenance costs.

Apart from the cases quoted above, there are a number of further directions in which attempts are being made to reach perfection.

As an alternative type to the Teleprinter 3A, telegraph machines arranged for printing on a wide band of paper usually described as column printers have been brought into use in place of Wheatstone on some of the main news circuits.

From an engineering point of view the maintenance of such machines is higher than for tape printers because the mechanism is necessarily more complicated.

One set of apparatus, which comprises a separate transmitter and receiver, is shown in Figs. 5 and 6. An indicator can be seen on the right of the transmitter in the first photograph. This, together with a lamp, warns the sending operator when to transmit the signal necessary for returning the paper platen in the receiver unit for the next line of printing.

Referring to the second photograph, which shows the receiver, it will be noticed that the mechanism is mounted on a stand. The roll of paper used for printing is contained in a box underneath, and from here it is fed upwards through an aperture to the platen. Separate stands, however, cannot be conveniently accommodated in a telegraph instrument room, and some difficulty is entailed in cutting the instrument tables which is therefore necessary.

Prior to the general introduction of Teleprinters multiplex working was in general use between the larger towns in this country, the system chiefly used being the Baudot.

Although remarkably good results have been attained with multiplex operation, the maintenance of unison between apparatus at each end of the circuit has been the chief problem. This has necessitated a considerable amount of engineering attention and has been responsible to a great extent for the high cost of maintenance.

With Teleprinter working automatic correction is provided with each character signalled, and unless during one revolution the difference in phase between the sending and receiving shafts exceeds a certain limit, no difficulties occur. On this account the question of unison is much less acute.

On a multiplex set, keyboards, receivers, distributors, vibrator and other constituent parts of the installation are spread over a comparatively wide area, and faults may take some time to diagnose and remove.

The Teleprinter, on the other hand, measures 1 ft. 10 in. by 1 ft. 3 in.; it is a self-contained sending and receiving unit and is provided with plug and cord connexions. It can therefore be replaced within a minute or two, if a fault occurs.

So far as freight and handling is concerned, the difficulty associated with the Teleprinter 3A is its bulk and weight, the latter being about 80 lb. The supply of a baseplate with carrying handles has facilitated the manhandling of the machine, and for transport purposes special packing cases have been provided.

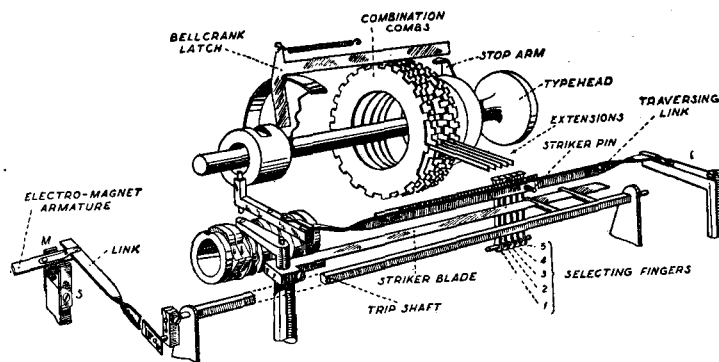


FIG. 4.

The amount of auxiliary apparatus, galvanometers, condensers, relays, &c., required for Teleprinter circuits is considerably more than for the equivalent number of Baudot channels, so much so that difficulty has been experienced in conveniently arranging the required number of items within the standard table space. The obvious remedy for this is segregation and panel mounting of the terminal apparatus, in a convenient position remote from instrument tables. This system has been adopted at Leeds, and there is every probability that the arrangement will be extended to other offices.

Fig. 7 shows the bays accommodating the terminal apparatus for 8 circuits at Leeds Head Post Office. Teleprinters specially set apart for the purpose can be plugged into either of the test-bays and worked to a distant station, or to the instrument table, they can also be used "in leak" to observe signals in either direction. Jacks are inserted in the leads between the panels and the instrument so that faults may be localised. By means of a concentrator panel, not shown in the photograph, either of the 42 terminal apparatus sets rack-mounted can be joined to any teleprinter in the instrument room, without disturbing the line conditions or rebalancing.

The Teleprinter programme has entailed the provision of a considerable number of additional lines on certain routes and in some cases sufficient physical pairs are not available. This situation has been met by—

- (a) Unbunching telegraph conductors which have formerly been used to obtain required duplex speeds on long routes, and adopting two-channel working for Teleprinter operation. The type of circuit used is known as two-loop simplex, one loop being used for sending and the other for receiving. On account of the fact that no balancing adjustments are required the arrangement has been very favourably received by the operating staff.
- (b) By utilising spare telephone pairs, in which case special precautions are taken to avoid interference with the telephonic speech currents.
- (c) By superposing either on telegraph or telephone pairs, or on phantom telephone circuits. In the last arrangement, known as double superposing, the sending and receiving teleprinter channels are superposed on four phantom telephone circuits, which in turn are obtained by superposing on eight telephone pairs. (Fig. will appear next month.)
- (d) The possibilities of voice frequency transmission with a view to its economic adoption is also being explored.

Additional circuits naturally involve a large increase in the number of batteries. At some offices this has caused the accommodation to be severely strained, and motor generators, which require less space, have been provided in order to overcome the difficulty.

Again, provision for driving the Teleprinter motors has also necessitated special arrangements, owing to the absence of a standardised system of power supply. It was found that over 11 different types of motor were required

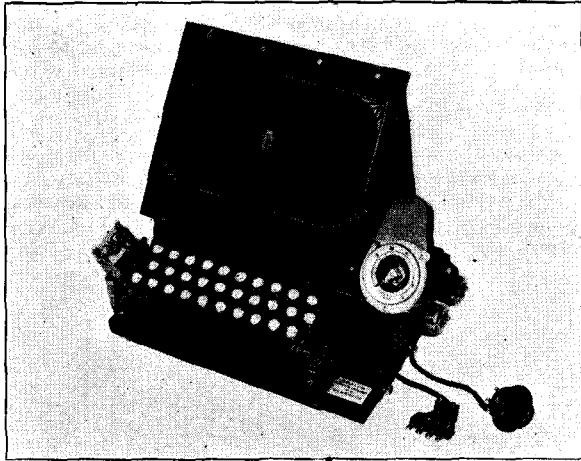


FIG. 5.

to cover the variations in alternating current systems, while 3 different types sufficed for direct current supplies. Alternating current motors are not as satisfactory as direct current, and efforts are being made to standardise a 110 v. d.c. motor by introducing copper oxide rectifiers. A further development in this direction is envisaged in which the motor drive, the line, and the "local" circuits will all be operated from the output side of the rectifier. As a matter of fact, the "all mains" Teleprinter set is already an accomplished fact, and the operation of many of our telegraph circuits without batteries is not an impossible vision of the future.

The maintenance problem has loomed large since the general introduction of Teleprinters. In large centres officers having experience of machine telegraphs are available, but in small offices where Teleprinters have replaced

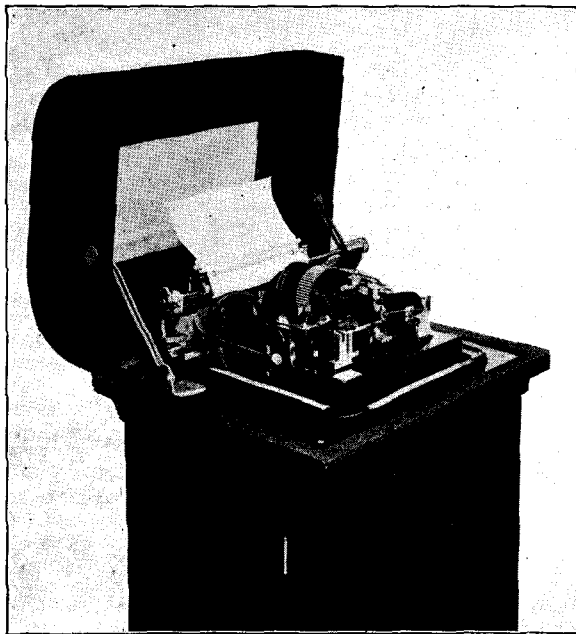


FIG. 6.

Morse circuits, the requisite skill and experience is not always at hand. Apart from this, in small offices a mechanic, for obvious reasons, cannot be detailed solely for telegraph duties.

The general trend of policy is in the direction of allowing the operating staff to perform a larger share of the day-to-day adjusting and regulating of Teleprinter apparatus and this will, of course, ease the situation. It has lately been decided that a certain amount of technical instruction is to be given to new entrants on the traffic side. In addition to this, however, a training school for traffic officers is held at G.P.O. West, running concurrently

with a similar school of instruction for engineering officers. The total effect of these measures is reflected in the satisfactory returns of circuit stability to be shown in graphical form in the second part of this paper.

In the event of a breakdown of apparatus, spare machines are held in London as part of an engineering reserve, and these machines are available for immediate despatch to the Provinces. In addition, a comprehensive stock of spare parts is also kept for repair purposes. In this connexion it is perhaps interesting to note that the Teleprinter 3A consists of over 600 different parts.

These parts have all been photographed and incorporated in a number of plates associated with a technical instruction recently circulated. Complete units in some cases are stocked and issued as a whole, the only work required locally is to withdraw and replace a few screws. This provides for the office where no workshop facilities exist. On the other hand, the smallest pins, rivets, &c., are held for repair work in the mechanic shops at important centres.

A scheme for the periodical overhaul of machines will probably be introduced at an early date. Each machine will have a life history card showing details of faults. The card will always accompany the machine and will enable weaknesses which may in some cases be inherent to be located and dealt with.

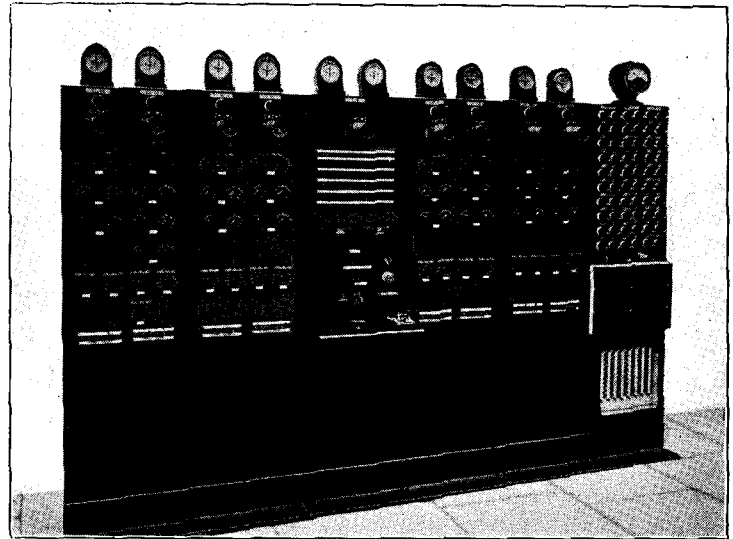


FIG. 7.

With regard to the total effect on engineering time allotted to maintenance it is perhaps too early to reach final conclusions, especially in view of the increasing share of minor maintenance work which is being undertaken by the operating staff. Considering the number of simple Morse circuits which have been substituted by complicated Teleprinter apparatus the figures at present available do not indicate the increase which might be expected. The total man-hours spent on all types of telegraph apparatus in the United Kingdom and Northern Ireland before the general introduction of Teleprinters in 1927 was about 700,000. In 1930, after about 1,000 machines had been brought into use, the figure was approximately 656,000, actually a decrease of about 44,000. The average time spent on the Teleprinter 3A annually is 150 man-hours, but with the introduction of the periodical overhaul system this will possibly be reduced.

The cost of replacements, however, is likely to increase. The average cost per telegraph set throughout the country is 10s. per annum, while that for the Teleprinter is £2.37.

This brings the first portion of to-night's paper to a close. It has not been possible within the allotted time to mention much which might have been included, of the work done as a result of the present reorganisation, by the various sections of the Engineering Department, nor has it been found practicable to describe the several directions in which future development is likely to proceed, such as, for instance, the extensive scheme being contemplated for the provision of private wire teleprinter circuits, and the forthcoming teleprinter exchange, although some mention will be made of the latter in the second half of the paper.

It will probably be agreed, however, that sufficient has been said to indicate the considerable amount of research, design and development work now being carried through by the Engineering Department. The strenuous efforts necessary to meet the sudden increased demands for auxiliary apparatus which have been entailed, alone, is not the least of the problems which have had to be faced.

The arrangements in our telegraph offices have been revolutionised, and the days of Morse, Wheatstone and Baudot are passing away. While still more remains to be accomplished and further problems await solution, there is more than good grounds for belief that, from an engineering standpoint, no reason exists for depression concerning the future status and efficiency of the British Telegraph Teleprinter Service.

TELEGRAPHIC MEMORABILIA.

FOR the last year or two this vain scribbler of "Memorabilia" has been making desultory enquiries from the one or two scientific sources which have been open to him regarding the possibility of utilising wavelengths below one metre, and at more than one of such centres of research and information there was always a more or less intense belief that the ultra-short wave would ultimately come into its own. When, however, just before Easter, the successful results of trials between St. Margaret's Bay and Blanc Nez, under the joint control of the International Telephone and Telegraph Laboratories (Inc.), Hendon, and the laboratories of Le Matériel Téléphonique, Paris—with wavelengths as low as 18 cm. were made known, there was undisguised surprise in more than one quarter that the problem of the micro-wave had been solved so soon.

One had grown used to wavelengths a few thousand metres long, with frequencies which the normal brain could fairly well grasp, but the jump to the other extreme of anything between 10 and 100 centimetres, with their oscillations hovering in the neighbourhood of fifteen or sixteen thousand millions, was a real staggerer. To this we may add a final stroke, for *The Electrical Review* considers "that the range of wavelengths between 10 and 100 cm. is ripe for commercial use"! Following on these stupendous figures, we have had Marchese Marconi informing the *Daily Telegraph* that he had successfully experimented with wavelengths of 5 cm. and a frequency of 6,000,000,000 per second!

Obituary.—With deep regret one records the passing of an old and much esteemed ex-Superintendent, formerly of the C.T.O., London, in the person of Mr. A. C. Paffard—"A Curious Person," as he himself was whimsically wont to translate the three initials of his name. To his devoted daughters are tendered the sincerest sympathy of many old friends and colleagues, and more especially so because of the unexpectedly sudden nature of the call. Though in his 80th year he was remarkably well to all appearances the previous day, and, as an old oarsman, had enjoyed to the full the broadcasted description of the University boat race, retiring to rest as usual, only to be found in his last long sleep by his daughter the following morning.

Deceased was an all-round and ardent athlete and took part in many of the C.T.O. and Civil Service meetings of the late '70's and '80's, was an active member of the Telegraph Company of the 49th Middlesex R.V. and actually won the 100 yds. championship of the battalion, then under the command of the late Captain Blanchard.

Other Pensioned Officers' News.—Mr. J. P. Aldis, late A/S, night Staff, and formerly engaged "Up the Street," successfully celebrated his 80th birthday as our last issue went to press. Our old colleague commenced his telegraph service in the Electric & International Telegraph Co. in 1863! It is satisfactory to be able to state that Mr. H. J. Broughton, late Supt., Cable Room, is now out of hospital and convalescing on the South Coast. We wish every success to those retired L.P.S. folk who, it is understood, are contemplating the formation of a Retired Officers' organisation, somewhat on the lines of that of the C.T.O. reunions. The fact that a very old organiser, in the person of Mr. W. Davis, M.B.E., Treasurer of Benenden Sanatorium, &c., is one of the "agitators," an early and lasting success may be expected.

Canvasser or Representative?—Mr. J. McCarthy, in his interesting and informal talk on "Canvassing" at the C.T.O., London, on Mar. 11 last, without doubt struck a right note when he emphasised the inappropriateness of the title "Canvasser," and suggested "Representative" as a more dignified and, one would add, alluring title. "What's in a name?" A great deal, very frequently, especially when one has to deal with business houses which have their own delicate *nuances* in these matters.

Companies.—The Société Française de Visio-Téléphonie is the name of a new concern, says *The Electrical Review*, which has been formed in Paris (146, Avenue des Champs Elysées) with a capital of £64,000, to exploit the Baird television patents in France and the French colonies. Indian Radio Telegraph Co., Ltd., Reuter announces from annual report, net profit £51,000, carried forward £14,175. Ordinary shares dividend 12½% and 8¼ deferred, tax-free. International Telephone & Telegraph Corp., quarterly dividend on no-par-value shares 50 cents per share. International Automatic Telephone Co., profit £134,024 for 1930, dividend, ordinary, 10% for year, carried forward £92,980. Automatic Telephone Mfg. Co. Ltd., report 1930 dividend 12½% as previous year. Great Northern Telegraph Company of Denmark maintains total dividend and bonus at 20%. Reserves and renewals fund at end of 1929 were £4,182,309, compared with issued capital of £2,000,000. At same date reserve and renewal investment account was £3,349,380 and cash at £2,295,813. Telegraph Construction & Maintenance Co., Ltd. At the annual meeting of this company, on Mar. 26, the Chairman (Earl of Selborne) among other matters mentioned that "the competition of wireless had effected orders for cable, but the fact that the American Telephone & Telegraph Co. was projecting a telephone cable across the Atlantic in order to provide a 24-hour telephone service, which was not possible with wireless, was a significant testimony to the reliability and growing importance of the high-speed loaded type of cable as a potent factor in communications. On the success of this scheme would to some extent depend the type of future submarine cables."

Countries.—AFRICA.—According to *The Electrical Review* the Marconi Company have received orders for the erection of transmitting and receiving wireless stations from the administrations of Uganda, Kenya Colony, Tanganyika, Northern Rhodesia, Southern Rhodesia, and the Union of South Africa. The new stations will be used both for the Cape to Cairo air route and in many cases for general communication. ALASKA.—*The Sale of a Cable-Radio System!*—The Alaskan cable-radio system, the only large one of its kind operated by the U.S.A. Government (Army Signalling Corps) is to be sold to private enterprise. The system was organised and built in 1900 under an Act of Congress authorising the establishment of telegraph lines over the Alaskan Territory and the laying of a cable from Seattle. AUSTRIA.—The new 75/120-kw. radio station which Ravag is to build at a cost of £100,000 will be situated about 30 miles from Vienna in order to avoid interference with the commercial telegraph station. BELGIUM.—Reuter's Brussels Agency informs us that the Committee which is being set up to investigate means of dealing with the problems arising from the overlapping of wavelengths was appointed some few weeks ago by the Minister of Posts and Telegraphs. It is thought that some considerable time will elapse before a report on the matter is likely to be ready. FRANCE.—The State Railway have now equipped 22 trains with broadcast receiving equipment, which enables passengers to listen to concerts transmitted from French and foreign stations and also to hear gramophone records played on the trains themselves. Telegrams, says Reuter's Paris Agency, may now also be sent from post offices to passengers on certain express trains on the State railways and the passengers can also reply. It is hoped shortly to extend the service to all railway lines. *Howling and the Mayor.*—The mayor of Bihorel, near Rouen, has issued a by-law prescribing penalties for the operation of wireless sets in such a manner as to cause howling and other interference with the reception of neighbouring listeners. *The Radio-Caen Station fined 2s. 8d.*—The Radio-Caen wireless broadcasting station, it may be recalled, commenced transmitting before authority was given to do so and has been fined accordingly. The sting of this little piece of French history lies in the fact that although the fine is a negligible one from a monetary point of view, actually it has brought a heavy bill for expenses, while the actual transmitter, which was confiscated in the first place, has not yet been returned. *A New Radio Telegraph Station.*—A wireless station more powerful than any hitherto built in France is now under construction just outside St. Nazaire. Destined for telegraph communication between France and shipping in the Atlantic, says Reuter's Paris Agency, the new station is expected to be completed by the autumn.

GERMANY.—Free Licences for the Unemployed!—As from Mar. 1 last the German Post Office is authorised to give those unemployed listeners receiving unemployment pay free listening licences. This is done on one condition only, and that is that such persons must have been listeners for at least three months before becoming unemployed and they must prove by the 25th of each month that they are still unemployed for the free licences to be continued. **New Broadcasting Stations.**—The construction of new stations has been under consideration by the Reichs Post Amt authorities for some time, says *The Electrical Review*. Sufficient funds have now been granted and alterations at Königs Wusterhausen have already progressed so far that the increase of the *Deutschlandsender's* power by 5 kw. was expected to be a fact by the end of last month. The Langenberg new 75 kw. transmitter will be ready in the autumn. A new high-power station will be built at Breslau, also a new large station at Leipzig, while the power of the Frankfurt Main transmitter is to be increased to 25 kw. **World-Radio** states that it has also been decided to erect a relay station at Trier which will be linked up with the Cologne or Frankfurt-Mühlacker group. **Interference and a Hairdresser.**—A Berlin hairdresser was recently summoned by a listener for causing interference with radio programmes by means of the electric hair-drying apparatus regularly used in his establishment. After a long discussion the summons was dismissed upon payment of costs by the recalcitrant barber, who was, however, warned that a repetition of the offence would result in imprisonment.

GREAT BRITAIN.—The Post Office estimates make provision for a B.B.C. income for 1931 of £1,194,500, an increase of £134,500 on the 1930 figure and an additional grant of £22,500 to the cost of arrangements made between the B.B.C. and the Covent Garden Opera Syndicate for the production of Grand Opera. **Wireless Trade in Great Britain.**—A census among radio manufacturers detailed in *The Wireless and Gramophone Trader* reveals the satisfactory fact that the wireless industry of Great Britain in 1930 had a turnover of £20,000,000. Of this sum £7,000,000 accounted for the sale of complete installations. £32,000,000 for British telephone and telegraph development! The Post Office and Telegraph (Money Bill), 1931, seeks to authorise the issue of £32,000,000 as capital for the development of the postal, telegraph and telephone systems. Of this sum, it is estimated that £29,200,000 will be required for the telephone service and £2,800,000 for the postal and telegraph services. **Close of Sheffield Relay Station.**—Notice has been given by the B.B.C. to terminate the tenancy of the Sheffield premises, preparatory to closing the station when the new regional station at Moorside Edge has been finally established. The Sheffield relay station, by the way, was the first in Great Britain. The Television Society's third annual exhibition was held at the University College, London, on April 15. Nearly twice the floor space was occupied this year. Ninety per cent. of the exhibits were genuine amateurs' work. A complete receiver built, unaided, by a 14-year-old student member of the Society, was a remarkable effort. The British Post Office loaned prints received in London by the Siemens-Karolus system from Continental, which were admired by not a few of the critical visitors.

HOLLAND.—The new aerial system of the Philips Eindhoven station (PCJ) is the only short-wave station maintaining a regular international service dedicating programmes to practically all countries, says *The Electrician*. On a wavelength of 31.28 metres the station is now transmitting on three distinct aerial systems, A, B and C, thus: Aerial A is an ordinary broadcast system simply radiating in all directions, Aerial B radiates east-west, pointing to the Dutch East Indies on one side while radiating in the opposite direction to the west. Aerial C is also a new directional directed to the south-west with the idea of reaching South American countries. **HUNGARY.**—At a cost of £600,000 the Hungarian Radio Company is contemplating erecting a new station of 150 kw. power. The company, of which the State is a shareholder, has an income from subscribers of more than £150,000 per annum. Five relay stations are also to be built.

INDIA.—The *Electrician* informs us that Standard Telephones & Cables, Ltd., has received from the Indian Telegraph Department

an order for a carrier telegraph system for the Bombay-Calcutta route, comprising one high-frequency carrier telegraph system and four carrier telegraph repeaters. **ITALY.**—*The Electrical Review* states that "having a short-wave wireless station of world-wide range now operating from the Vatican, the Pope has ordered that all his Nuncios abroad and all his Cardinals at home and abroad are to be provided with receiving instruments. A time-table is being fixed for them to receive direct communications from the Pope or the Cardinal Secretary of State in order that Church matters and foreign affairs may be attended to with regularity and rapidity." An official communiqué foreshadows changes to be made by the directorate of Italian broadcasting. The policy of increasing the power of stations and the extension of the network is to be continued. This will involve a request for the allotment of more wavelengths to Italy to provide alternative programmes in each region with a minimum of one at any time of the day irrespective of weather conditions. It is also proposed to erect a low-power colonial transmitter at Asmara (Eritrea). **POLAND.**—Reuter's Trade Service at Warsaw informs us that the wireless station at Raszyn—certainly one of the most powerful in Europe—is to change its name, and its programmes will henceforth be announced as coming from Warsaw. Actually Raszyn is quite close to the Polish capital. It appears that we of the Anglo-Saxon race and countries are prone to mistake "Raszyn" for "Russia," and thus, for "Raszyn," in future, please read "Warsaw." The station was built by the Marconi Company and will soon be opened by the President of the Polish Republic.

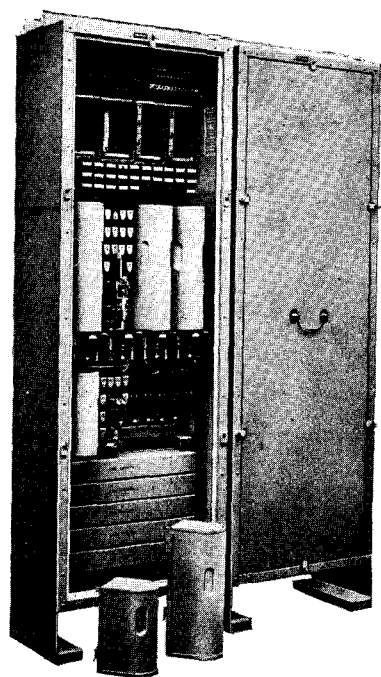
SWITZERLAND.—*The League of Nations' New Radio Station.*—Prangins, near Geneva, the new League of Nations station, as part of its equipment, is to be supplied by the Société des Ateliers de Secheron, with three groups of converters capable of energising the anodes of the transmitting valves at 10,000 volts. The new wireless station at Sottens (Vaud) was officially opened on Mar. 25 last. It transmits on 403.8 metres, says Reuter's Agency, Berne. Sottens is 17 km. north of Lausanne. It is British built.

U.S.A.—The New York correspondent of the *London Daily Telegraph*, some week or two back, recorded the prediction of Mr. M. H. Aylesworth, President of the National Broadcasting Company, that, "there will be grand opera by radio television in every American home in three years from now." It is recorded that students in the School of Journalism and University of Wisconsin have to use the Teletype printer, edit telegrams, and invent headlines, &c. It has long been known in this country that the telegraph organisations in America were alive to the money-making potentialities of a "Mothers' Day." Perhaps the writer is a little behind, but it was not till the other day that he learnt that the privilege of special rates and forms has now been conceded to mother-in-laws' day. **Freight Trains and the Radio!**—After several years' experience the telegraph and telephone services of the American Railway Association has announced that radio communication between ends of long freight trains has been found practicable and that suitable apparatus for the purpose has been developed. Until now engine and caboose crew have kept communication chiefly by means of whistles or hand signals. This is not always satisfactory in inclement weather or when trains stop at curves. Short-wave radio sets have been found adequate to the problem and to use in "switching" and "classification" yards. A study of radio and tug-boats is also being made. **N.B.C. Revenue.**—The National Broadcasting Co.'s total receipts in 1930 amounted to \$22,000,000, as against \$14,000,000 in 1929. **VENEZUELA.**—The town of Maracaibo, the headquarters of the Venezuelan oil industry, has lately been provided with two telegraph cable connexions with the United States. One is a direct line established via Curacao, St. Domingo and New York, while the other is via Barranquille in Colombia and Panama.

Tolerance.—Tolerance means reverence for all the possibilities of Truth. It means the acknowledgment that she dwells in diverse mansions and wears vestures of many colours, and speaks in strange tongues.—*John Morley.*

J. J. T.

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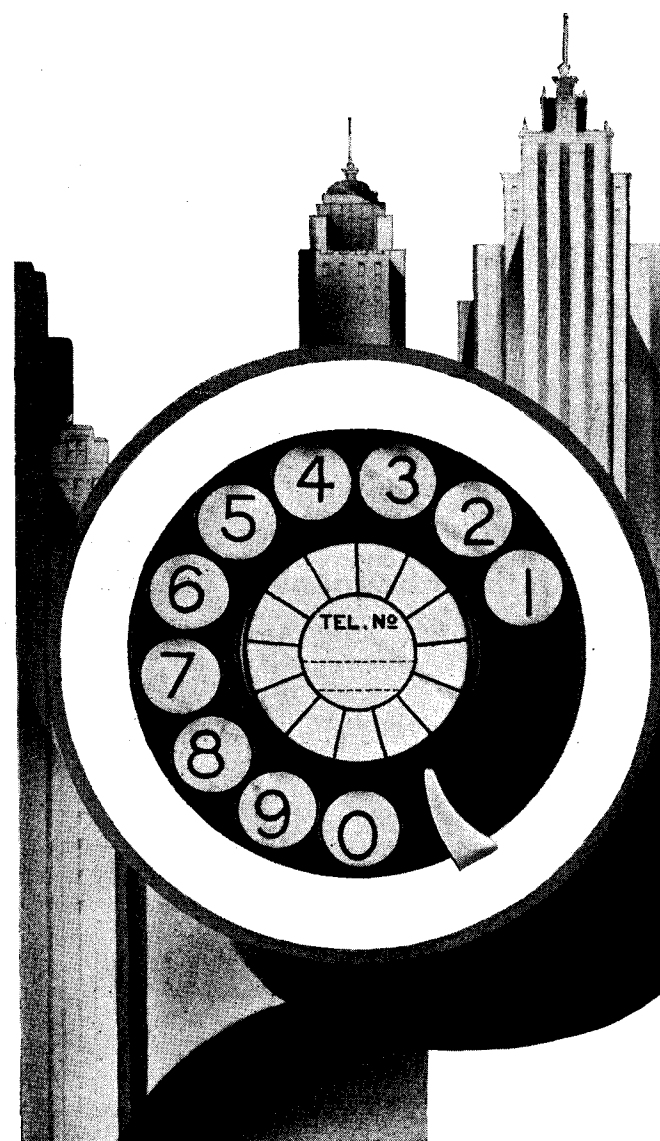
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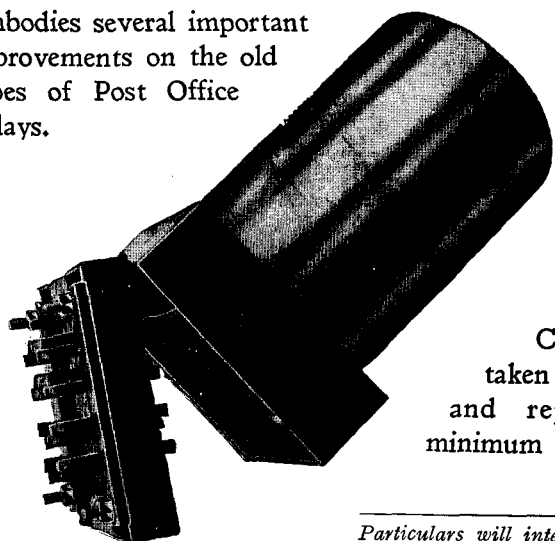
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A confidential memorandum on the subject of methods of quoting and terms of payment customary in relation to business in Roumania, prepared by the Commercial Secretary to the British Legation at Bucharest, is now available in the Department of Overseas Trade and is issued to firms whose names are on its special register. British firms desirous of receiving a copy should communicate as above but quoting Reference C.X. 3476.

J. J. T.

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EXHIBITIONS.

EXHIBITORS AND THE USE OF THE TELEPHONE.

BY J. A. DICKINSON.

THE treatment of subscribers renting telephones at the annual exhibitions held in London differs in many respects from that of ordinary subscribers.

This is necessary owing to the temporary nature of the service required and the fact that exhibitions are held at irregular intervals throughout the year.

The exceptional nature of this class of telephone user affords an opportunity for examining the use made of the telephone at exhibitions and glancing at the progress made in recent years, in addition to surveying the whole field in its relation to the part the telephone plays in trade fairs of this kind.

Exhibitions of all descriptions are held in the various halls in London, but generally the term has a special modern significance as applied to public shows of goods for the promotion of trade.

The first exhibition in this sense of which there is any account was held by King Ahasuerus, who, according to the book of Esther, showed the riches of his glorious kingdom many days, even one hundred and fourscore days. The exhibits, it is recorded, consisted of white, green and blue hangings fastened with cords of fine linen and purple to silver rings and pillars of marble.

The first exhibition since the Christian era was at Venice in 1268. On that occasion there was a grand display consisting of a water fête, a procession of the trades, after the fashion, one can imagine, of the Lord Mayor's show and an industrial exhibition.

The first modern exhibition has been referred to as the one held at London in 1756 by the Society of Arts.

The importance attached to these displays for the promotion of business can be gauged from a statement made by a jury of practical men so long ago as 1801 who, reporting on the Louvre Exhibition, said:—

There is not an artist or inventor who, once obtaining thus a public recognition of his ability, has not found his reputation and his business largely increased.

And more recently, in 1906, we find that the British Board of Trade appointed a special committee to enquire into the nature and extent of the benefit accruing to British arts, industries and trade from participation in international exhibitions. The committee found that although opinions differed concerning the extent of the benefits accruing they reported that participation could not be discontinued.

It constituted an advertisement both for the individual exhibitors and for national trade in general.

France was frequently the centre for exhibitions held during the last century, and the Paris Exhibitions of 1806, 1819 and 1849 attracted 1,422, 1,622 and 4,500 exhibitors respectively.

The first great international exhibition held in London was in 1851. A site was obtained in Hyde Park and a building 20 acres in extent was erected.

It remained open for 5 months 15 days and attracted the then enormous total of over 6 million visitors. The number of exhibitors reached 13,937, of which number Great Britain contributed 6,861.

The extent to which the telephone would be required at an exhibition of this kind held in the heart of London is an interesting speculation. One can easily visualise a full unit exchange of 9,400 lines.

The number of call offices alone would probably exceed the total subscribers existing to-day on a good-sized suburban exchange. In addition to the exceptional demand on line plant the traffic design section would be busily engaged with numbering schemes, as an international exhibition on such a scale would have its large P.B.X. groups in addition to the smaller groups and individual exchange lines.

The development section would have little if any data on which to base its forecast.

It is, of course, true that we have recently had the British Empire Exhibition in 1924/25 at Wembley. The use of the telephone has since then made considerable headway and continues to move forward.

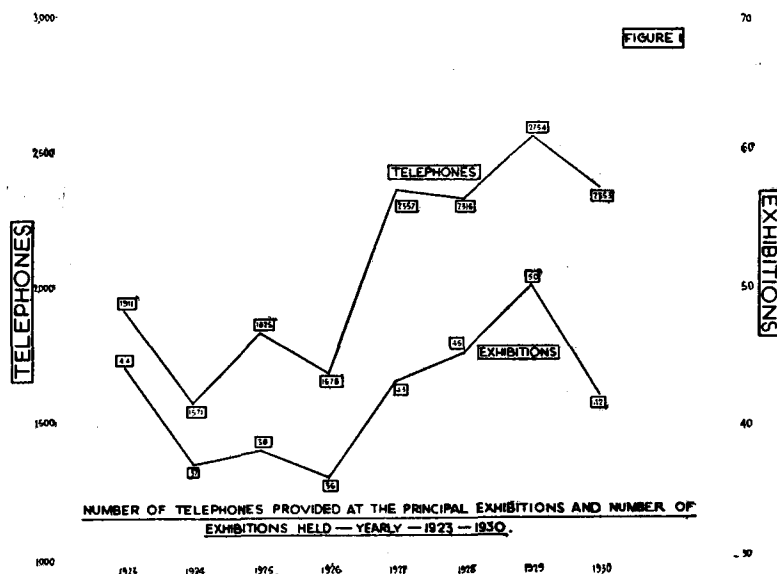
The British Empire Exhibition was the first of its kind held in this country in which the telephone played an important part.

Originally intended to last for 6 months during 1924, it was decided to reopen it in 1925. The maximum number of lines fitted at any period of the exhibition was 970, this figure being reached in July, 1924. In an exhibition of this size and character it has to be remembered that its influence on telephone development is not confined to the exhibition site and buildings. In the case of Wembley Exhibition it was known that a large number of houses in the locality were sublet for the period of the show to visitors, many of them from abroad, and this, together with the additional call office facilities provided at railway stations and other public places, accelerated the demand for telephones in the district.

So far as can be ascertained there are no published figures of the number of exhibitors at Wembley of the kind available in the case of ordinary trade fairs. The arrangement of the exhibition in which each colony or dependency occupied a separate hall was no doubt the reason for this. The grouping of exhibits in countries under one central authority nullified the unit value of exhibitors. Compared with some of the previous figures quoted for International Exhibitions, it is worth repeating that Wembley occupied an area of 220 acres and was attended by more than 27,000,000 people. Its chief object was to display the wealth and resources of the British Empire and to promote Imperial unity.

The Paris Exhibition of 1889 attracted over 32 million people and nearly 62,000 exhibitors, whilst at the Liège Exhibition in 1905 there were 16,119 exhibitors and at San Francisco in 1915 the number of exhibitors was 30,000. An international exhibition held in London in these days would produce a telephone yield of the kind never previously experienced in this country. If such an exhibition were held it may be found necessary to establish an exchange on the exhibition site. Whilst we can only speculate as to the immense possibilities of large-scale exhibitions and their relation to the telephone, we have much more definite information regarding the annual trade fairs held in London throughout the year.

The principal hall where these demonstrations are held is Olympia. Some other important places used are White City, Crystal Palace, Agricultural Hall, Albert Hall, Holland Park Hall and prominent places like the Central Hall, Westminster.



For subscribers at short period exhibitions it has been found desirable to fix a special tariff, and special facilities must be available at all times to meet the exceptional demands on exchange equipment and line plant.

For these exhibitions, which vary from three days to three weeks, and occasionally even longer, weekly tariffs are offered. The rental of a line for a period not exceeding one week is £2 10s. Each additional week or part thereof is charged for at the rate of £1 5s. 0d. The charges cover rental and 1d. and 2d. call fees.

Trunk calls are charged at the tariff rates. Internal extensions may also be rented at special rates.

The rates were laid down as the result of detailed consideration of the costs and the average period of exhibitions.

As it is necessary in order to meet telephonic demands that the probable requirements at each exchange should be known as long as possible before the opening date, lists of exhibitors are obtained from the organising trades as early as possible.

Each exhibitor is notified of the telephone facilities offered and records kept of the lines and stations required, and by this means adequate line plant and exchange equipment is secured.

Fig. 1 shows the number of stations provided and the number of exhibitions held in each year since 1923 up to the end of 1930.

In the year ending 1924 the number of telephones provided was 1,571, which was less than in any other year during the period under review. In 1929 the figure had grown to 2,754. An explanation of the sudden decline in 1926 may be attributed to the industrial disturbance in that year. The still sharper decline in the year just ended is significant of the widespread trade depression existing at the present time.

Although there is a marked falling off in the total number of telephones provided in 1930 as compared with 1929, the average number of telephones provided per exhibition does not show any diminution.

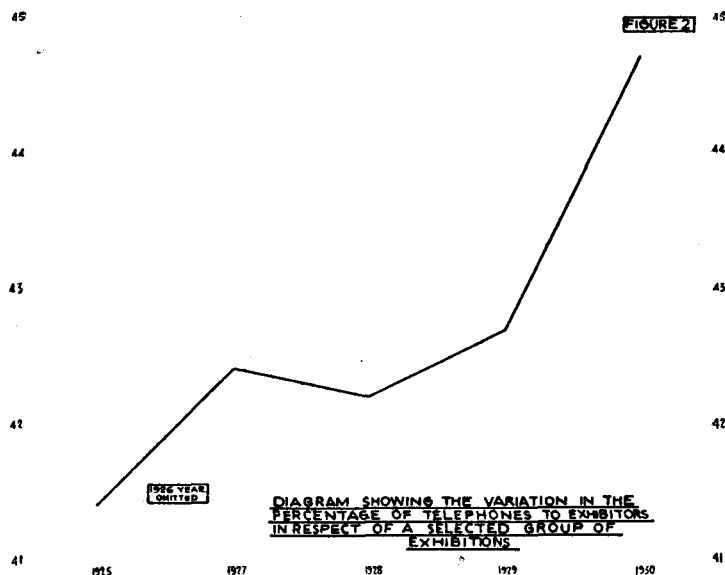
In fact, the average number of telephones provided per exhibition in 1930 was higher than in any previous year.

In 1924 the average number was 42, whereas in 1930 it reached its highest point, when the figure was 56.

Complete details of the number of days in a year on which exhibitions were in progress is not available, but some idea of the time occupied can be gathered from the particulars which have been compiled for the last four years.

No. of days on which exhibitions were in progress ...	Year.			
	1930.	1929.	1928.	1927.
	301	379	330	314

It will be observed that these figures bear a definite relationship to the number of exhibitions held in each year, as shown on Fig. 1. The figures do not include occasional one-day shows and no allowance has been made for Sundays, the total time from the commencement to the close being taken in every case.



In some instances where complete particulars of the duration of an exhibition were not available the data have been completed by applying the average of the days occupied by the rest of the exhibitions.

The figures indicate that up to the end of 1929 there was an increasing tendency to hold trade shows, and the slump in 1930 is probably only temporary. In 1929 the average number of days per exhibition was 7.6, and if this factor is applied to the exhibitions held in 1924, when the telephone yield was lowest, we get the following result:—

$$37 \times 7.6 = 281 \text{ exhibition days.}$$

This compares with a total of 379 for 1929.

It is too early to forecast the probable results for 1931, but indications are not lacking that even greater interest is being taken by manufacturers and buyers in forthcoming exhibitions. Long before the opening of the British Industries Fair this year the acceptances of invitations to overseas buyers to visit the British Industries Fair showed an increase of 29% compared with last year.

The extent to which the telephone is now used at exhibitions is illustrated in the next diagram (Fig. 2). The graph covers a period of five years, the year 1925 being substituted for 1926 owing to the unsettled conditions prevailing in the latter year. The statistics refer only to a proportion of the exhibitions held in the year where complete figures of the number of exhibitors, telephones fitted, and the duration of the exhibition are available. They include, however, the Motor Show, Ideal Homes, and British Industries Fair. Owing to the inclusion of the Motor Show, where the ratio of lines is comparatively high, the percentage of telephones to exhibitors is inflated and the influence of the inclusion of the Motor Show on the figures can be gauged from Fig. 3, where the position in respect of this exhibition is shown separately.

The points brought out by the comparison indicate that there has been a steady increase in the percentage of telephones to exhibitors, but what seems to be of more importance is the margin still available for future development.

Particulars are available which enable the progress made in the use of the telephone at the Motor Show to be given for the last seven years, and

with the exception of the year 1928 a steady increase in the percentage of telephones to exhibitors has been experienced. Last year, when the percentage was 74.6, the number of telephones provided was 433 and there were 580 exhibitors. There was a sharp upward climb of both exhibitors and telephones in 1930 due to the opening of an additional wing at Olympia, thus affording further space, resulting in an increase of 55 additional exhibitors and 46 more telephones. In the year 1923, when the percentage of telephones to exhibitors was at its lowest, i.e., 65.5, there were 537 exhibitors in respect of whom 352 telephones were provided.

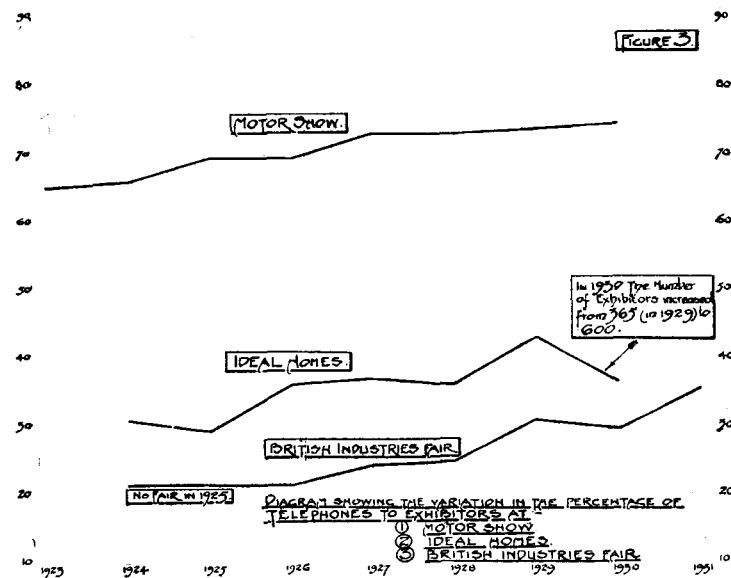
The figures for the Motor Show raise the question as to what should be considered the saturation point in telephone development. Of all annual exhibitions the Motor Show would perhaps be regarded as the most likely to yield a 100% telephone valuation. Judged by the present-day values applied to the class of business firm connected with the motor industry, it is an undoubted fact that every exhibitor would by every other standard be regarded as a potential subscriber, no matter how remote he may seem to-day from the need of a telephone and whether or not his presence in the show is only of a secondary nature. We must, I think, expect a still further rise in the percentage of telephones to exhibitors, and perhaps we shall still experience a rise of at least 1% per annum for many years to come, which is about the average rate of increase recorded in the last five years.

The margin for development at other exhibitions is much greater than that of the Motor Show.

So far as Olympia is concerned, the demands of the Motor Show are greater than at any other period of the year. But how long will this be the case?

We have already seen that the highest number of exhibitors at the Motor Show was reached last year, when the total was 580. This figure is much below that generally experienced at the British Industries Fair. In each of the last three years the number of exhibitors at the British Industries Fair has exceeded 1,000, and there is evidence that the number will be well over the thousand mark this year, and with the additional space available at Olympia we have perhaps not yet reached the peak. There is, however, nothing like the same telephone density at the British Industries Fair as there is at the Motor Show. The maximum number of telephones provided at the British Industries Fair was in 1929, when the number reached 364* out of a total of 1,184 exhibitors.

This represents a yield of telephones to exhibitors of almost 31%, a figure which is slightly higher than that for the year 1930. During the period of five years from 1925 to 1930 the maximum increase was approximately 10%, and for the Motor Show for the same period the increase amounted to about 5%. There are factors in connexion with the British Industries



Fair which do not apply in the same degree to that of the Motor Show. The Motor Show was patronised by practically the whole of the motor industry before 1925, whereas the British Industries Fair has considerably increased in importance and in the number of exhibitors during the last five years.

* Since this was written the returns for the British Industries Fair are to hand for 1931, and these have been added to the diagram—Fig. 3.

As anticipated, the number of exhibitors was well over a thousand and the number of telephones provided exceeded 400. The percentage of telephones to exhibitors also shows an appreciable increase on any previous year.

Since 1925 the number of exhibitors at the British Industries Fair has doubled itself, but there has been an increase of less than 50 at the Motor Show. It may be considered that the large increase in numbers showing at the British Industries Fair has favourably influenced the percentage increase in telephone development. But this is doubtful. On the contrary, it is probable that the additions have on the whole had a less telephone potentiality than the original exhibitors showing in 1925.

The latter view is supported by what has happened at the Ideal Homes Exhibition (see Fig. 3). Between 1924 and 1929 the number of exhibitors was practically stationary, the yearly average being round about 370. During the six years referred to the percentage of telephones to exhibitors increased from 31% to 43%, and except in the year 1925, when a slight fall was recorded, the succeeding years have either maintained the previous year's average or else shown an increase. But in 1930 there was a pronounced fall in the curve when the exhibitors increased in numbers to 600, a jump of practically 40%. This appears to indicate that a large accession to the number of exhibitors may produce a temporary decline in the percentage of telephones, but inasmuch as an increase in exhibitors is accompanied by additional subscribers the net result is an improvement in the telephone yield. One other deduction to be made from such cases of sudden substantial increases in exhibitors is the possibility of a much sharper rise in the percentage increase in telephones in the event of the number of exhibitors becoming more or less stationary.

The Ideal Homes Exhibition attracted in 1925 358 exhibitors and 106 telephones were provided, equal to a telephone yield of 29%. In 1930 the figure was 37% for 600 exhibitors, but in the previous year when the number of exhibitors was only 365 the percentage was as high as 43.

It will be noticed that the telephoning of the Ideal Homes approaches nearer to the average for all exhibitions as shown in Fig. 1 than either of the other two examples chosen.

Whatever conclusions can be drawn from these figures it would not be surprising if the rate of progress in the next few years in respect of the British Industries Fair and the Ideal Homes Exhibition surpasses the average of the results of the last few years.

If this happens we shall perhaps see the British Industries Fair with its much wider sphere for expansion demanding telephone facilities in excess of those of the Motor Show.

It remains to be seen to what extent progress in telephone development at exhibitions as a whole can be anticipated from the various data collected. Fig. 2 shows that the percentage increase during the last 5 years for a selected group of exhibitions amounts to 3.3. This indicates that something less than this figure must have been experienced in respect of the exhibitions outside the special examples dealt with. Some of the reasons for this are suggested below.

The three examples chosen, i.e., the Motor Show, British Industries Fair, and Ideal Homes, are extensively advertised shows having a much wider public appeal than the restricted exhibitions like the Bakers', Brewers', Business Efficiency, Chemists', &c.

In the case of the Motor Show, the class of client appealed to has already on the average reached a more advanced state of telephone development than the average of the public attracted by other exhibitions. The explanation offered in the case of the Motor Show, however, is scarcely true of the British Industries Fair or the Ideal Homes when considered in relationship to many other exhibitions. The returns show that in the case of many other exhibitions little or no progress has been made for a number of years. On the other hand, there are instances when telephone development has been at least as progressive as that of the three main examples cited. It is rather a sad commentary on the title of the Business Efficiency Exhibition to observe that only about a third of the exhibitors rent telephone service. The bakers find little or no use for it. The Furniture Trades show even better results in 1930 than the British Industries Fair. Against this we have the Medical Show, which has so far been satisfied with one telephone to about 20 exhibitors.

There is, however, evidence to show that the lag in the more backward exhibitions is showing a tendency towards recovery. Whereas in 1930 the British Industries Fair hardly maintained its 1929 ratio, the Ideal Homes declined, and the Motor Show increased by about 1%. The curve in Fig. 2 indicates that the overall increase in 1930 was rather more than 2%. There is a certain amount of risk in attempting to draw conclusions as to future development from the results achieved in one year, nevertheless the margin available for increased growth is so wide that even the most optimistic deductions may prove to be too low when compared with actual achievements during the next decade.

The experiences of the past indicating the tendencies of human nature are often misleading when forecasting the rapidity with which future changes will take place. Mankind has often stood on the brink of tremendous changes and had not even the faintest outline of what was in store.

One slight turn in the wheel of Destiny may produce hitherto unseen results, and with any relaxation in the conditions in the commercial and economic world, acting at present as a temporary check to the natural development of the telephone, the near future may yet reveal surprising results.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Feb. 28, 1931, was 1,971,098, representing a net increase of 9,157 on the total at the end of the previous month.

The growth for the month of February is summarised below:—

Telephone Stations—	London.	Provinces.
Total at Feb. 28, 1931	708,533	1,262,565
Net increase	3,022	6,135
Residence Rate Subscribers—		
Total	180,168	280,611
Net increase	1,483	2,043
Call Office Stations (including Kiosks)—		
Total	6,789	27,562
Net increase	78	174
Kiosks—		
Total	2,253	7,788
Net increase	42	146
Rural Party Line Stations—		
Total	—	9,226
Rural Railway Stations connected with Exchange Systems—		
Total	17	1,939
Net increase	—	9

The number of inland trunk calls made in December, 1930 (the latest statistics available) was 10,450,875, bringing the total number for the year up to 120,310,016, which represents an increase of 3,821,448, or 3.3%, on the total for the previous year. Outgoing international calls in December numbered 43,952, and incoming international calls 47,540, making the totals for the year 542,568 and 583,651 respectively. The increase over the previous year's figures was 14,672 (2.8%) in the case of the outgoing traffic and 13,566 (2.4%) in the case of the incoming traffic.

Further progress was made during the month of March with the development of the local exchange system. New exchanges opened included the following:—

PROVINCES: Birmingham—Birchfields, Harborne, Northern, Victoria; Preston (Lancs)—Ashton-on-Ribble, Leyland (all automatics); Aldington (Ashford), Ashover (Chesterfield), Bampton Castle (Faringdon), Barnby (Beccles), Church Minshull (Crewe), Coedpoeth (Wrexham), Clarbiston (Haverfordwest), Corby (Kettering), Dappleheath (Rugeley), Fulbourn (Cambridge), Five Ways (Kilmarnock), Great Leigh (Chelmsford), Great Horkesley (Colchester), Hellifield (Settle), Little Budworth (Tarporey), Longsdon (Hanley), Meifod (Welshpool), Middleton Scriven (Haydon Bridge), Mattishall (Dereham), Old Dailly (Girvan), Shipton (York), Sissinghurst (Cranbrook), Sliderry (Brodick), Skirling (Biggar), Tockwith (York), Uffington (Wantage), Upton Noble (Shepton Mallet), Woolaston (Church Stretton), Wolviston (Middlesbrough)—all rural automatic;

and among the more important exchanges extended were:—

PROVINCES: Elland, Frinton-on-Sea, Malvern, Shettleston (Glasgow), Sutton Coldfield, Willenhall, Yeovil—all manual.

During the month the following additions to the main underground system were completed and brought into use:—

Chester—Mold; Southampton—Fawley; Manchester—Wigan (additional cable); Stockport—Whaley Bridge; London—Fenny Stratford and Fenny-Stratford—Birmingham (Sections of London—Birmingham—Liverpool cable. Replacement of existing cable by a new cable of increased capacity); Oxford—Farmoor (Section of Oxford—Witney cable),

while 73 new overhead trunk circuits were completed, and 75 additional circuits were provided by means of spare wires in underground cables.

THE TELEPHONE PLAY.

"SAY IT WITH MUSIC."

WE have come to regard Miss McMillan's "Telephone Play" as a hardy annual. As we are not horticulturists, we hasten to explain, in order to avoid being misunderstood, that by this we mean a plant which springs up each year from the same soil and puts forth fresh and gay flowers—or refreshing fruit, as the gentle reader may prefer. This year's effort was called "Say it with Music," and commanded an interest and enthusiasm equal to that of its predecessors. It is, we believe, an established convention that the first scene of the Telephone Play should be laid in a switchroom or adjacent office, and we are accordingly introduced to a bevy of pretty girl applicants for the post of telephonist, awaiting the entrance of the "Lady Director." The slight plot turns on the fact that the said applicants have got wind of the news that a famous film star (male) is about to visit the exchange in search of local colour, and they wish to be employed in the exchange in order to meet him. The second scene shows the opening ceremony (with very little ceremony) of the new exchange in the presence of a sprightly American anxious to learn how it is done in the old country. The American "falls for" one of the telephonists, and the celebrated French film star, accustomed to universal adoration, succumbs to the stern Lady Director—the first woman, apparently, known to repel his advances. In the third scene, as often happens in musical plays, all the characters find themselves invited to a cabaret, which affords an excellent opportunity for the many talented performers whom Miss McMillan annually assembles to give a taste of their quality in song and dance. At the same time each Jack has his Jill and all ends happily. But the surprise of the evening is when the owner of the cabaret turns out to be the stern "Lady Director," Miss Love (a rôle well suited to the sound and finished style of Miss Price). A Lady Director of the telephone service as a sort of night-club queen is a terrible thought, but Miss McMillan's audience (largely composed of telephonists), seem inured to and unharmed by their annual dose of shocking and subversive ideas like this. We have not space to quote, though we should like to, some of the excellent and pointed lyrics. One of the greatest successes was a song of farewell to the decreasing bonus (well rendered by Mr. Cracknell) with a most effective chorus, "How Can I Live Without You," sung by sobbing telephonists to that familiar air. We must, however, quote some of the "axioms" inculcated in budding telephonists:—

When in doubt refer the case to the Secretary.

When about to be in doubt, refer the case to the Secretary.

When not in doubt, or ever likely to be in doubt, refer the case to the Secretary.

Languages spoken by telephonists are more expensive than those spoken by Supervisors.

Nothing may be done without authority.

Even things which are simply not done may yet be authorised—but nothing which is authorised may be done simply.

A Peg Count is said to be unrepresentative when it proves the need for more staff.

In the Traffic Branch two figures relating to the same thing shall not agree, neither shall either be right.

These appealed enormously to the audience, and we are sure the last will delight those numerous critics of ours who have a "wrong number" complex.

Amongst the cast must be specially mentioned Mr. Arthur Hemsley, who sang and acted with equal gusto as Bartholomew Chickweed, Hiam D. Shocking and Karl the Wandervogel, Mr. Walter Beale as the Frenchified film idol, who hit off the part very happily, and Miss Peggy Murray, who improves every time one sees her, as Adèle. Miss Norah Cheason was charming as the Supervisor, and we can heartily say the same of many of the "Candidates," amongst whom was Miss Latimer with a smaller part than usual. Miss Price and Mr. Cracknell we have already referred to, but we must make special mention of the four "Mothers" in their successful quartet. We hesitate to refer to the disguised

District Manager who was one of the "fathers." His subscribers in Broadwoodwidge and Widdicombe would simply not have believed it of him. Mr. Hugh Williams was very good in his familiar rôle of engineer; we particularly liked Mr. Dean in his finished rendering of the small part of a cabaret manager, and should like to add a word of praise to Mr. John Angus, as "Terry."

In the cabaret scene Miss Blair-Street sang with her accustomed skill, and Miss Nellie Potter and others presented an excellent variety of dances.

As usual, Miss Garvey proved herself a skilled accompanist.

The excellent stage effects and technical properties were the handiwork of Messrs. Cherry, Dean and Craft, who gave their time and labour unsparingly, contributing in no small measure to the success of the production.

LIVERPOOL NOTES.

WE regret to have to report the death of Mrs. Aickin (née Nicoud), wife of Mr. S. N. Aickin, Exchange Superintendent, Royal, Liverpool. Mrs. Aickin was formerly in the Service and well known to many members of the Liverpool staff. Her demise at a comparatively early age is a source of deep sorrow to her many friends. To Mr. Aickin and his daughter we extend our deepest sympathy in their bereavement.

The funeral took place at Lower Bebington, and was attended by representatives of the District Manager, Traffic and Exchange staffs. Several beautiful floral tributes were sent from different sections of the staff and from individuals.

Mr. Edwards, who has been assisting the Traffic Staff at Birmingham during the last four or five months in connexion with the inauguration of automatic working in that city, has returned to Liverpool. It is gratifying to learn that Mr. Edwards made himself popular with his temporary colleagues and that they would not let him leave Birmingham without some little mark of their esteem, which took the form of a fountain pen.

The Liverpool Golfing Society commences its activities by an opening stroke competition at Bowring Park on April 23. An attractive programme has been arranged and members are looking forward to an enjoyable season.

Liverpool offers a hearty welcome to Mr. L. G. Jeary, who comes from the Land o' Cakes to take the place of our recently promoted friend, Mr. Brocklesby, in control of the Liverpool Internal Engineering Section. We hope he will find his work and official associates congenial to him, and the neighbourhood to his health and well being.

Extract from the "Isle of Man Times."—"The Editor of the *Isle of Man Times* created another record in the telephone world, so far as the *Isle of Man* is concerned, during his recent holiday cruise on the *Laconia*, a Cunard liner. Whilst the vessel was at Gibraltar, he rang up home, and enjoyed the pleasure of speaking with his mother, some 1,400 miles away. By waiting until 9 p.m., the charge for the telephone is halved; so entering the Grand Hotel he asked to be connected with Douglas 532, and in 20 minutes or so the call was through. For six minutes' talk the fee was only 10s. A week later, in Barcelona, 1,000 miles away, a call was put through in under 15 minutes to the *Isle of Man*, at a cost of 9s. The voices were clear and distinct, as much so as if he had been making an insular call. Previously our Editor has spoken to Australia and to New York and to Cleveland, but in these cases the call was by wireless telephones. The calls from Gibraltar and Barcelona were by ordinary land line through Madrid, Paris, London and Liverpool. This is the longest land line message ever received in the *Island*. It is on occasions like this that one appreciates the value of a telephone service in the home or in the office."

Thumb-nail Lecture at a Traffic Officers' Meeting with Operators.—Correctness.—While there are various desirable qualities which an operator should possess, there is no doubt that one of, if not the most important, is correctness.

Without this the others are largely wasted.

The service suffers and the subscribers are annoyed.

A prompt reply is negated if the request is incorrectly received or dealt with and delay, if nothing worse, ensues.

A correct taking of the number, a correct repetition thereof, a correct connexion of the number asked for, and we get and give satisfaction.

As you know, operating errors, as shown by the observation reports, are nothing less than incorrectness at some stage, and if these were eliminated we should get the ideal service.

Therefore I say, pay particular attention to correctness and much of your other troubles will vanish.

This applies equally to A and B and Trunk operators, and of course goes far beyond the particular examples I have given, but I do not intend this to be more than just a note on the importance of the subject.

W. E. G.

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

V.

EXPLAIN the mechanical operations involved in the transmission to line of the letter "R" on the Teleprinter No. 3A.

A prize of a book will be awarded for the best answer, which should reach the Editor by May 31. The correct solution will appear in the July issue.

SOLUTION OF QUESTION III.

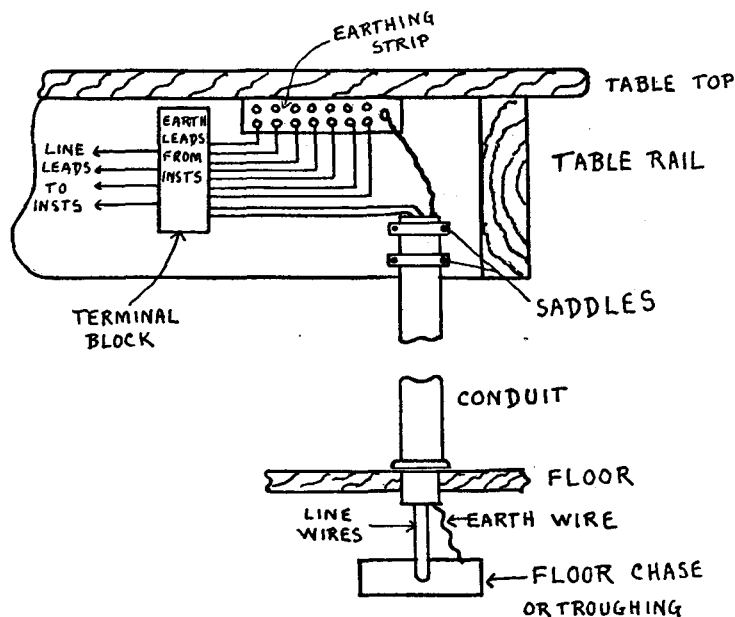
The invitation given by the question set in the March *Journal* did not evoke a great deal of response. Possibly the question savoured too much of the screwdriver and pliers. Should such be the case the question set this month will restore the balance in favour of the telegraphist.

Mr. R. S. Smith (Hull) gave the best answer, illustrated by a very fine diagram. The diagram, however, traced the wiring from pole, earth plate and cells, and is too full of detail for reproduction.

A model answer and illustration are given.

The standard method of wiring telegraph instrument rooms is as follows:—

(a) Line wires.—The line wires are taken from connexion strips at the bottom of the testboard to the instrument tables by cables laid in the floor chases. At the instrument table the line wires are terminated on terminal blocks fixed inside the table top to the back horizontal rail. From the terminal block to the instruments enamelled and flameproof wire is used.



METHOD OF SERVING LINE AND EARTH WIRES TO INSTRUMENT TABLES

(b) Battery leads.—From the main distribution cabinet to the distribution and fuse cases, usually fitted on every third table, cables for the various voltages are run in floor chases. At the table fitted with the distribution and fuse case, known as Cut-out No. 3, the cables run in vertical iron troughing to the base of the cut-out where the wires are connected to the brass bars behind the

fuse mounting. Wires from the cut-out are taken direct to the protective resistance for circuits on the same table as the cut-out. For the two adjacent tables wires from the cut-out are connected by means of a terminal block on each table.

(c) Earth leads. The earth wire of an instrument room is a 7-strand soft copper wire run in the floor chases. At each instrument table a 3-strand copper wire is tied to the larger wires and terminated on an earthing strip under the table top. The strip has 7 terminals. A flameproof wire for each terminal set is run between the instrument and a terminal block, from which connexion is made to the earthing strip.

READING NOTES.

In the Development race, milestones in the Reading District are passed fairly rapidly. The district reached the 45,000 stations mark a few weeks back.

Mr. R. J. M. Parsons, High Clerical Officer has been promoted to the position of Chief Clerk, St. Albans, and took up duty at that office on Mar. 2.

Many congratulations on his promotion were showered upon Mr. Parsons and a presentation, which took the form of a grandmother clock and a cake stand, was made to him prior to his leaving the district.

In the absence of the District Manager, on sick leave, the presentation was made by the Chief Clerk, Mr. F. C. French, who, while regretting the loss of Mr. Parsons, assured him of the good wishes of the Staff and emphasized the fact that his promotion had been well earned. Other speakers all of whom expressed their regret at Mr. Parsons' departure, but joined in with their congratulations on his promotion, were Mr. Davie, Higher Clerical Officer, Mr. Coulsell, Contract Manager, Mr. Magnall, Traffic Superintendent, Mr. Drescher, Senior Clerical Officer, Accounts Section and Mr. Luscombe, Contract Officer, Class I.

A letter from the District Manager was read and in this Mr. Moorhouse, in a very delightful way, expressed his appreciation of Mr. Parsons' services in the Reading District, his pleasure and congratulations on his promotion.

Then we have to congratulate Mr. E. Drescher, Clerical Officer, on his well-earned promotion to the Higher Clerical Grade. He will take over the Rentals section, which until recently was controlled by Mr. Parsons.

And we have welcomed Mr. Brewer to our midst. Mr. Brewer has been promoted to 1st Class Contract Officer from the Colchester District.

We can well do with his extra efforts to push our barge forward against, alas! a strong tide.

Telephone Staff Meetings.

Telephone staff meetings were held at Reading on Jan. 12 to 15 and at Oxford on Mar. 3 to 5, 1931.

Ninety-four Telephonists and 6 Assistant Supervisors at exchanges within approximately 15 miles of Reading attended the lectures at Reading, while at Oxford 46 Telephonists and 3 Assistant Supervisors from exchanges within a similar distance, and from Banbury, were present. In all 18 exchanges were represented at these gatherings.

On the second day of the Reading lectures the District Manager attended and addressed the staff on general matters of the Service.

The meetings consisted of a lecture by Mr. Magnall, the Traffic Superintendent, and discussions, each of about an hour in duration. The lecturer dealt with such matters as quality of service, call values, operating statistics, ticket recording, ineffective calls, &c., relevant facts being demonstrated by large scale graphs (prepared locally) showing, for a typical exchange, the average speeds of answer, of line and supervisory signals, the percentages of ineffective calls and subscribers satisfied. Drawings on a large scale of the new ticket T.T. 3, call value schedules and operating statistics graph were also exhibited. Mr. Magnall gave a lucid explanation of the reasons for the various instructions which have been issued from time to time regarding the timing of trunk calls. He described the existing timing devices at present in use, and also those which are visualised for the near future.

In all there were twelve meetings and there is reason to think by the interest evinced and by the many unsolicited expressions of appreciation by the staff, that they have served a very useful purpose.

It may be of interest to mention that we have twenty new exchanges under way, and by the mercy of Providence (sometimes called the Engineering Department) we hope to have them all open this year.

CONVERSION OF PRESTON AREA TO AUTOMATIC WORKING.

SATURDAY, Mar. 28, saw the last of the Preston, Ashton-on-Ribble, and Leyland Magneto Exchanges, as upon that day the area was successfully converted to automatic working.

Events of this character are, so to speak, milestones in the history of a town, and it is perhaps pardonable to indulge on these occasions in a little retrospection.

Strange as it may seem, the story of Preston closely follows that of London, and there are many points in common between the Capital city and the town which was once a "Capital" of the North.

Each in its very earliest days was fixed on high ground, below which, a little distance away, ran a tidal river, and Preston Parish Church has its counterpart in St. Paul's Cathedral.



[Photograph by courtesy of "Preston Guardian."]

INAUGURATION CEREMONY, PRESTON AUTOMATIC EXCHANGE.

Left to Right: Mr. Randal Bell (Surveyor, N.W. District), Mr. J. M. Shackleton (Supt. Engr., N.W. District), Mr. V. R. Kenny (Asst. Surveyor, N.W. District), Mr. J. K. Murray (Dist. Manager, N.W. District), Mr. G. S. Sunley (Head Postmaster, Preston), Alderman T. H. Atherton (Mayor of Preston), Miss H. Bacon (Supervisor, Preston).

Each town had its "moor" stretching away on its northern boundary, and in London this is still shown by the names of Moorgate and Moorfields. Each had its walk by the river, which is still known as the Strand, and each had a small tributary stream known as the Fleet.

Each had its memories of the Friars and others who lived in religious houses. Each gained early recognition in charters given by the Crown, and each saw the rise of powerful trading companies. But, whereas the wealthy City companies of London are able each year to make a procession in the "Lord Mayor's Show," Preston has to content itself at the present time with a "Guild Procession" every twenty years.

Just as London had its noted Temple Bar to mark the boundary between it and Westminster, so Preston up to recent times had various "bars" at its different boundaries, and, as the "Lamb" can be seen in the grounds of the Temple, so the same emblem can be found on most of the property of the Preston Corporation.

In the field of strife, too, Preston has had its fair share. For instance, over the place where the Fulwood Satellite Exchange now stands, once raged the last big battle of the Civil War.

Progressively, too, Preston has always been in the forefront. In 1816 its streets were lighted with gas, and it claims the distinction of being the first town—outside London—to have its streets lighted in this way.

And now Preston is again in the van with a telephone system of the latest type. An official opening ceremony was held at Booth's Cafe, Preston, on Wednesday, April 1, when the inauguration of Preston's automatic telephone system was declared complete by the Mayor (Alderman T. H. Atherton).

The Mayor and a party of about 80, including county and municipal authorities and leading business men of Preston, were taken over the New Exchange in the Post Office extension, and were shown the working of the system. The inauguration then took place.

Mr. Randal Bell, who presided, referring to complaints that had been made about the extra charge of 2s. a quarter for the combined type of instrument, said that they were only acting on the elementary business principle of adjusting charges to costs, where demand made such a plan feasible. Mr. Bell pointed out that there were four telephones to every three motor cars in Great Britain, while in America they had only three to every four cars.

Mr. J. K. Murray, in his remarks, gave some interesting details of the past telephone history of Preston and what the future had—so far as could be seen—in store. He also placed before the company, in telling terms, the advantages of the telephone in business and private life.

Mr. J. M. Shackleton, Superintendent Post Office Engineer for the North-Western District, said that in the new Exchange there were 36,000 relays with 150,000 contacts, approximately 1,000,000 selector switch-bank contacts, and millions of soldered connexions.

The ceremony concluded with a vote of thanks which included the Press and which was carried with acclamation.

GLASGOW TELEPHONE NOTES.

MRS. REID, Travelling Supervisor (the subject of our photograph), on her retirement from the service owing to having reached the span of life laid down by the Post Office, has been the central figure of two interesting meetings recently. On Mar. 23, at a meeting of Exchange Supervisors held in the Operating School, and at which Mr. Coombs presided, Mrs. Reid was the recipient of a gold wristlet watch. Mr. Coombs referred to the splendid work performed by Mrs. Reid, and Mr. Johnston, Traffic Superintendent, and other colleagues added their word of praise. On Mar. 24 the staff of the



MRS. REID.

outside Exchanges met in the Central Test Room, where, in most congenial company, Miss Jeffrey, of Kirkintilloch Exchange, presented on behalf of her colleagues employed in the outside exchanges, a wallet containing Treasury notes. Miss Cameron occupied the chair with distinction, and although the tributes paid to Mrs. Reid were many, they were all deserved. Yet again was Mrs. Reid the central figure at another gathering in the Traffic

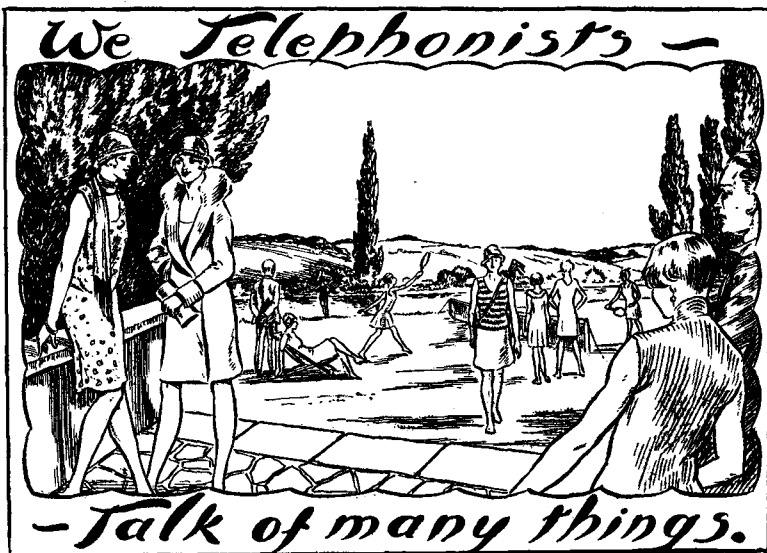
Office, where Mr. Coombs again presided over the presentation, by the Traffic Branch and a few other friends, of a further tangible reminder of the regard in which our friend was held.

Mrs. Reid entered the service in May, 1888, and resigned on her marriage in 1899. On re-entering the service Mrs. Reid was appointed a Visiting Officer to Exchanges, and subsequently Travelling Supervisor. In her retirement we wish her all happiness, and should she feel inclined to sigh for the days when she was in harness we are sure that a perusal of Charles Lamb's Essay on "The Superannuated Man" will supply the philosophy to cease her sighing.

Without Trimmings, but Delightfully Human.—The following is extracted from a subscriber's letter:—

"I learned an old adage at school: 'Save mankind from the consequences of his folly and the world would be peopled by fools.' . . . I can't put my dog on your man when some day he does stroll along with an instrument, and it's not worth a forty-shilling fine to walk round the Head Post Office and give somebody a thick ear . . ."

Marriages.—Miss J. S. A. Steel, Trunk Exchange; Miss L. Matheson, Central Exchange.



What I might Have Been.

I WAS prevented, unfortunately, from being present at the meeting on Mar. 6, at which the prize papers were read on the subject "What I might have been." Consequently I continue to wallow in my ink-stained rut and remain unenlightened by the wisdom of others and uninspired by their vision. To contemplate what I might have been, opens up such a wide and speculative vista, that I feel like a small boy who is sat at a table full of rare pastries, wondrous ices, superb drinks, and ravishing sweets, and is told to go ahead. Aladdin in the cave is not more bewildered. Precious seconds are lost in irresolution and in anticipatory sensations. But here the simile ends—neither you nor I will ever know what I might have been but each of us knows for a certainty what that small boy will be!

It is easy to think of all sorts of things—pleasant and unpleasant—that I might have been. Twins, for example—did I hear you shudder! How jolly for the world for two of me to be littering the landscape and should I be jealous of me? Had I followed the inclinations of my earliest years I should, like all the other small boys of my age, have been an engine-driver, or a guard who is permitted—oh blissful privilege—to jump on the footboard of a moving train, or a porter who may slam doors without being sent to bed supperless. Later desires would undoubtedly have made me a cow-boy, complete with broncho—bucking variety essential—and lasso, shooting from the hip in the interests of law and order. Or, failing that, a highwayman, very kind to my faithful steed, gallant to ladies but ruthless with dandies and rich noblemen. The profession of pirate had its distinct appeal—Spanish Main preferred but no reasonable offer refused.

Other times, other manners, and I have thought that I might become many other things and persons, but who would have thought that I might be what I am? No one did, fortunately. To be what we are is one of the most wonderful things in the world, and yet none of us dares to say that we are what we might have been lest we be charged with conceit or lack of ambition and ideals. Our thoughts as to what we might have been are governed by what others are in our eyes and the ideals we have. Not a few of us make the mistake of being so occupied with regretting what we are not that we have no time to become what we might be.

Of course, I might have been the Editor of this column. In that case there's no telling what you might have become. I should have been very ruthless, however, with that usurper.

PERCY FLAGE.

Elocution and Essay Competitions.

The trophy presented by the London Telephonists' Society for annual competition between "teams" from individual exchanges was a reproduction of Alonzo's "Portia."

The poem selected for the test was a sonnet by Siegfried Sassoon. The Misses V. E. Hankin (Maryland), V. F. Wood (Buckhurst), and R. E. Poppleton (Wanstead) formed the winning "team," while Miss N. Cheason (Temple Bar) gave the best individual rendering. A photograph of the winners (including Miss Cheason) is given below. To identify them, read the names in the order given from left to right.



In all its forms, the "Second Chance" and what one would do with it—so convincingly treated by Sir James Barrie in "Dear Brutus"—is always a fascinating theme for speculation; and it is therefore not surprising that the subject of the Society's Essay Competition—"What I might have been," produced a series of excellent papers. Here is a photograph of the winners of the Competition:—



From left to right the names of the prizewinners are Mr. T. Oldham (Traffic Branch, Cornwall House), Miss C. Morse (Welbeck), Miss Myra S. Williams (Grosvenor) and Mr. W. G. H. Cox (City Night Staff), each of whom contributed a paper which was enthusiastically received by a large audience of the Society's members at the meeting already referred to.

Flaxman and the League of Nations.

A most enjoyable evening's entertainment was organised by the Flaxman Exchange Staff at a dance given in aid of the Chelsea Branch of the League of Nations at the Chelsea Town Hall recently.

The hard work of the organising committee met with a well earned reward in the success of the whole evening. The occasion was the more interesting as several members of the Chelsea Branch of the League of Nations graced the event by being present, including Mrs. Hubert Walter, President, who accepted a bouquet presented by Miss Clement, the Supervisor-in-Charge; Captain Green, M.A., the Chairman of the Executive Committee, Chelsea Branch; Miss Mary Selby, Chairman of the Central Group; Dr. Alice Benham, Chairman of the World's End Branch; Miss Muriel MacKenzie, Honorary Secretary; and Mr. Eric Branch, Chairman of the Youth Group. The Hon. Mrs. Clay, Chairman of the Sloane Group Committee and Miss Huntington, J.P., Chairman of the Education Committee, sent letters of regret of their inability to attend.

During the evening Captain Green made a speech explaining the aims of the League in the endeavour to educate nations against War and all the attendant evils; and expressed his gratification to the members of the Flaxman Exchange for their splendid efforts which had met with such success.

The District Superintendent, Mr. Buckeridge, who was also present, always shows a keen interest in the League; and his presence was very much appreciated by all.

It is expected that approximately £15 will have been raised from the entertainment for the benefit of the League.

In Friendship's Name.

That the value of the International Telephone Service as an agent in the promotion of international friendship is something more than a pleasing idea is shown by the circumstances to which the letter reproduced below relates.

On Mar. 22 last Fräulein Käthe Traupe, Telephonist at Bremen, while on a visit to London, met with a fatal accident. The sad news quickly became known to her colleagues at the London Trunk Exchange, who promptly collected 36s. from the Exchange Staff for a wreath and wired it to Bremen; subsequently sending three representatives to Waterloo Station as a mark of respect when the body of their late colleague—whom they had never seen—was taken home.

This is a copy of the letter received by the Trunk Exchange:—

"To the Ladies and Gentlemen Staff Telephonists of London who made so fine and appropriate a gesture of international sympathy and fellowship to their German colleagues in Bremen on the occasion of the sad and untimely death of the Bremen Post Office worker Fräulein Käthe Traupe in London on Mar. 22.

"We, the undersigned fellow countrymen of yours, wish to express our great appreciation of your deep sympathy, on our own behalf, and also for the bereaved parents on the untimely and sad death of Fräulein Traupe. It was indeed a graceful and sympathetic gesture of international understanding to appoint Miss Davies and her two lady colleagues to represent you at Waterloo Station on the departure to-day of the bereaved father. Herr Traupe carried away with him to Germany a deep impression of your spirit of friendship which was uppermost in his mind when we bid him goodbye at Southampton.—Yours sincerely,

(Sgd.) F. PHILIP DYSON.
(Sgd.) MAX BELLOWES."

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

C.T.O. NOTES.

Promotions.—

- Miss A. J. McCarthy, Supervisor to Supervisor (H.G.), Telegraphs.
- " B. M. Luffman, A/Supervisor to Supervisor, Telegraphs.
- " G. A. Tanner, A/Supervisor to Supervisor, Telegraphs.
- " O. M. Worth, Telegraphist to A/Supervisor, Telegraphs.
- " O. E. Hussey, Telegraphist to A/Supervisor, Telegraphs.
- " E. M. E. Shepherd, Telegraphist to A/Supervisor, Telegraphs.
- " E. L. Jolly, Telegraphist to A/Supervisor, Telegraphs.
- " H. S. A. Linford, Telephonist to A/Supervisor, Class II, Telephones.
- " M. M. Hebden, Telephonist to A/Supervisor, Class II, Telephones.
- " L. R. Mayersbach, Telephonist to A/Supervisor, Class II, Telephones.
- " I. E. Fenn, Telephonist to A/Supervisor, Class II, Telephones.
- " D. A. J. Wilson, Telephonist to A/Supervisor, Class II, Telephones.
- " D. E. Ballett, Telephonist to A/Supervisor, Class II, Telephones.
- " A. S. Hawkins, Telephonist to A/Supervisor, Class II, Telephones.
- Mr. E. A. Knight, Overseer to A/Superintendent.
- " T. Galbraith, Overseer to A/Superintendent.
- " C. Cousal, Telegraphist to Overseer.
- " F. Kerr, Telegraphist to Overseer.

Retirements.—Messrs. C. A. Coster and L. H. Cullingham, Assistant Superintendents; B. Middleton, H. J. Cook and G. E. Giles, Telegraphists; Misses E. E. Hampson, Supervisor, and E. Seward, Telegraphist.

Obituary.—We regret to record the death of Mr. Philip Garrood, a former Superintendent at TS, in his 71st year. Mr. Garrood entered the C.T.O. in 1879, became an Overseer and Senior Telegraphist in 1905, was made Assistant Superintendent, Class II, in 1912, promoted to Superintendent in 1919 and retired in 1921.

The sincerest sympathy and condolence are tendered to Mrs. Philip Garrood and family by her late husband's old friends.

We also regret to note the passing of Mr. J. E. Faunch, who entered the C.T.O. in 1880, and Mr. W. Moore, who commenced his service at Exeter in 1886, coming to TS a short time after. To their families we extend our sincerest sympathy.

C.T.O. Veterans.—The C.T.O. Veterans Association held its Tenth Annual Reunion and Dinner at Anderton's Hotel, when a company of 71 sat down under the chairmanship of Mr. Frank Hudson. An attractive musical programme was provided and all expressed their satisfaction at the success of the evening.

C.O.D.O.C.—At the Cripplegate Theatre, on Mar. 18 and 19, the Dramatic Section of the C.O.D.O.C. presented "A Damsel in Distress." This comedy, in three acts, by Ian Hay and P. G. Wodehouse, is a trifle weak in plot but is very amusing and gives ample scope to the imaginative and thoughtful performer in depicting the extraordinary and unexpected situations which arise during the action of the play.

As a whole, the cast acted splendidly, under the very excellent direction of Mr. Donald Bidgood, and succeeded in producing a thoroughly enjoyable entertainment.

Ralph Richards, the stage door keeper (Mac'), might actually have had practical experience, so well was the part performed.

Miss Blodwyn Pugh, as Billie Dore, made a big hit; she certainly played the part of the American with good expression and marked ability. George Bevan, as portrayed by Bert England, was a handsome, gentlemanly young man, full of courage, but at times, perhaps, a trifle too studied. Miss Dorothy Mason, as Lady Maud Marsh, was clever in the personification of the repressed, over-guarded, yet much sought after young lady. Fred Morey, as Percy Viscount Totleigh, the simple, affected son of Lord Marshmoreton, is to be congratulated on his performance of a part which was by no means easy. Charles Phillips, as Albert Keggs, the butler, was good. Albertina Keggs, the between maid at Totleigh Castle, was played by Miss Ivy Turtle, who made good and full use of every opportunity. The thorough manner in which she did her best for her client was most amusing, and she deserved the keen appreciation shown to her. Lady Caroline Higgins, a stiff, starchy, interfering individual, was admirably portrayed by Miss Jessie Knight. Frank Treadway, as the Earl of Marshmoreton, acted splendidly; the very amusing remarks he made were rendered with judgment and emphasis and he thoroughly deserved hearty congratulations.

SOUTHAMPTON NOTES.

A LARGE company of members of the District Office Staff and their friends assembled at the Barova Restaurant, Above Bar, on Mar. 13, for the second Staff Dance of the season. We should like to set on record here our appreciation of the efforts of our energetic and enthusiastic Social Committee. Another delightful evening had been planned for us and a thoroughly enjoyable time was spent by all present. Mr. Lee, our District Manager, was as usual in our midst and gave his accustomed support, but we missed the company of Mrs. Lee, who on account of the indisposition of Mr. Lee, junior, was unavoidably prevented from being present. There was a general reluctance to leave the floor when the one o'clock gong was sounded, but an extension of the proceedings could not be arranged. The conveyances engaged to take us home were very welcome, and the high spirits of those members of the staff using them paid eloquent testimony to the pleasurable and successful nature of the evening.

OBITUARY.

It is with deep regret that we have to announce the death of an old colleague in the person of Miss Edith Coulston, Asst. Supervisor, Class I, at Royal Exchange, which occurred on Mar. 19, at Nottingham.

Latterly, Miss Coulston had not been in good health and had gone to stay for a long week-end with friends at Nottingham in the hope of recuperation, but complications rapidly intervened with fatal results.

Several of her colleagues were present at the interment, which took place at Nottingham, and a large number of floral tributes were sent by the L.T.S. staff.

Miss Coulston's gentleness and kindly nature had endeared her to all who were privileged to know her, and to her many sorrowing friends and colleagues at Royal and throughout the London Telephone Service we extend our deepest sympathy.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of March resulted in a net gain of 1,239 stations.

During the quarter ending Mar. 31 the net gain in stations was 10,695.

There were 207 telephones provided at the Ideal Homes Exhibition in respect of 500 exhibitors, which is equal to 41.4% telephones to exhibitors, compared last year with 36.3%.

The demand in the London area for the hand-microphone continues, the number of orders received up to April 11 being 38,346; of this number nearly 15,000 have been ordered since the beginning of the year.

An initial order has been received from Messrs. Ford, in connexion with the new motor factory being erected at Dagenham, for 18 exchange lines and 100 extensions, and on completion of the factory it is anticipated that the installation will be considerably augmented.

It will shortly be necessary to consider the preliminary syllabus in connexion with lectures and classes to be arranged for officers of the Department. Any suggestions from the staff for incorporation in future programmes would be welcomed and should be forwarded to Mr. J. A. Dickinson, K.D. 2A.

London Telephone Service Sports Association.

The Annual General Meeting was held at Cornwall House, in the Refreshment Room at 5.30 p.m. on Monday, April 13.

The chair was taken by Mr. Napier, C.B.E., who was supported by Mr. M. C. Pink and Mr. R. Tinniswood, O.B.E.

Mr. F. Meyer, the secretary of the executive committee, proposed a new constitution. Mr. Hugh Williams (Association Chairman), in seconding the proposal, stated that the committee decided, after considerable deliberations, not to enforce that members of the L.T.S. Association become shareholders of the C.S. Sports Council; on the other hand, he added that the officials of our Association would do their utmost to increase the percentage of shareholdings, at the same time pointing out members who use the sports grounds at Chiswick must hold one or more shares. The new constitution was then adopted.

The following officers were then elected: Chairman, Mr. R. Tinniswood O.B.E.; Vice-Chairman, Mr. Hugh Williams; Hon. Treasurer, Mr. C. Drabwell; Hon. Secretary, Mr. F. Meyer.

The business of the Association being concluded, Mr. Napier introduced Mr. A. E. Watson, C.B.E., Vice-Chairman of the Civil Service Sports Council and Chairman of their Finance Committee. A concert followed in which several well-known artistes in the L.T.S. took part.

Football.—To be champions of the lower division one year and achieve a similar distinction in the premier division in the following year is perhaps without parallel in the annals of L.T.S. football, and I have not heard that such a thing has happened previously in the Civil Service League. Before the match, against the Ministry of Health, on April 11, it appeared that a win for either team would virtually settle which team would head the table. As the L.T.S. won by a margin of 3 goals to none they are now certain to be champions. With so much depending on the result the match attracted an unusual amount of interest.

The L.T.S. were fortunate to win the toss, and elected to play with the sun behind them and had also some assistance from a wind which blew diagonally across the field. The Ministry of Health were quickly away on the left and for the first ten minutes they displayed the better football. Their forwards were quick on the ball, only fine defensive work by Constable and Futerman kept them out, and at half-time neither side had scored.

In the second half Futerman successfully hustled the backs and the ball coming loose Humphrey had only to tap the ball into the net for the first goal within a minute of the restart. The Ministry of Health could not make any progress against a sound half-back line, and with Bateman and Webdale constantly feeding their forwards the L.T.S. continued to enjoy much of the attack. A fine cross by Futerman resulted in Casey dashing in on the left to score a second goal, and just on time Futerman scored a third goal following a remarkable effort by Osborne. Ellis, as inside left, played a first-class game, especially in the second half.

Contract Branch Cricket.—Arrangements have already been made for matches to be played in the Shield competition this year. The Shield was held jointly with the Accounts Branch last year, but it is hoped to improve on the results of last season, and make certain of the trophy.

Most of last season's players will be available and perhaps a few newcomers will strengthen the team, but this question cannot be settled until the team

have been given a run at the nets. The following matches and dates have been fixed:—

1931.

May 19.—Practice at Battersea Park.

„ 22.—L.T.S. v. Secretary's Office, at Chiswick.

June 2.—Practice at Finsbury Park.

„ 3.—L.T.S. v. A.G.D., at Chiswick.

„ 16.—Contract Branch v. Traffic Branch, at Chiswick.

Tennis.—The arrangements for the annual tournaments have been completed.

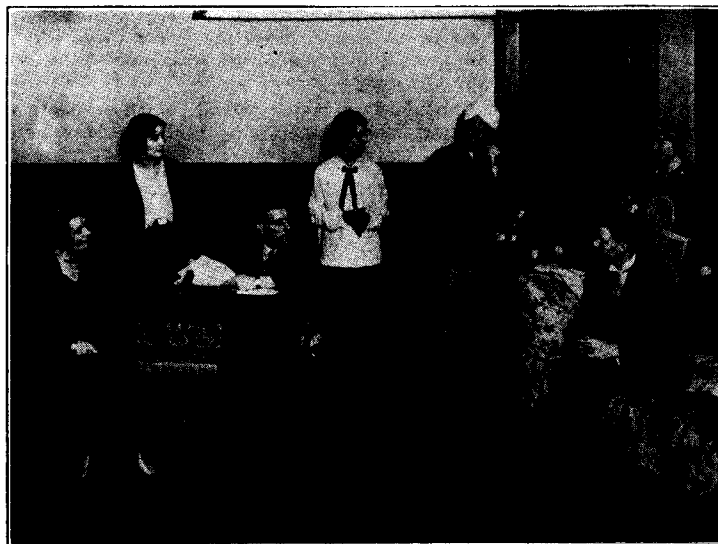
There are 28 entries for the Agnes Cox Cup (Ladies' Doubles) and 72 for the Pink Cup (Ladies' Singles).

All competitors have been advised of the result of the draw and the dates by which each round is to be completed.

The finals in each competition are to be played at Chiswick (C.S.S. ground) on Saturday, Sept. 19.

The Stamford Dramatic Society.

“*Murder on the Second Floor.*”—As I left the Cripplegate Institute after the Stamford Dramatic Society's presentation of “*Murder on the Second Floor,*” I felt that the merits of the performance had justified my attendance, and that the play had been so well presented as to make it worth the seeing. It was indeed obvious from the rising of the curtain on Act I that the players had mastery of their words and understanding of the characters they had to portray; consequently the play gripped and one was carried out of oneself into the land of make-believe.



STAMFORD DRAMATIC SOCIETY: “MURDER ON THE SECOND FLOOR.”

Miss D. Coleman. Miss E. Wilson. Mr. L. Starling. Miss M. Hulet.
Miss E. Hobdell. Mr. H. Cooper. Mr. F. Crossley.

Harold Cooper, as Hugh Bromilow, the author, unfolded his story of the murder with skill and with a clarity which made the plot easy to follow. Briefly the scheme of the play is that Hugh's work was inclined to be high-brow, and this did not appeal to his prospective fiancée—Sylvia Armitage, the daughter of the proprietor of the boarding house at which Hugh lodged. Sylvia therefore urged him to create a thriller, and Bromilow consented and revealed the story of the “*Murder on the Second Floor*”—the action of the play proceeding as the tale was told. The dramatic interest of the play centred very largely in the fact that Mrs. Armitage, the proprietress, had two boarders, Joseph Reynolds and Jam Singh, using her house as a base for dope traffic operations. Joseph, in addition to being a skeleton in Mrs. Armitage's cupboard, had also had an affair with Lucy Timson, the maid, a part excellently played by Mavis Hulet. The maid had proved to be an unsatisfactory servant and receiving her discharge, appealed to Reynolds for assistance, this Reynolds refused, and the girl, driven to despair committed suicide. Mr. Armitage, who suspected infidelity on the part of his wife with Reynolds, murdered him, and cleverly used the suicide of Lucy to camouflage his act.

Dorothy Coleman, the Society's business manager, gave an attractive and natural rendering of the part of Sylvia Armitage and Miss Hobdell also scored a popular success. She is especially to be commended on the dramatic way in which she gave vent to her feelings in an hysterical outburst, on finding Joseph Reynolds' body.

An excellent piece of comedy acting was introduced into the play by Elsa Wilson as Miss Snell, the boarding house spinster.

Frederick Crossley has served the Society well from its inception. He had abandoned his familiar role of aspirant for some fair lady's hand and assumed the character of a somewhat worn husband of 50. One of the most pleasing features of the acting was Crossley's grip of his audience as he confessed to the murder of Joseph Reynolds. Jam Singh, an Indian with an air of mysticism about him, was well portrayed by Lionel Starling—a newcomer.

The representatives of the forces of law and order—Lawrence Davies, the Inspector, and Andrew Rollings, Edgar Mann and Edmund Thring, as police constables—provided another touch of comedy and thereby added to the enjoyment of the evening.

Mr. Andrew O. Buck, the producer, is entitled to give himself a pat on the back, and a similar acknowledgment of the thanks of the audience is due to the Corelli Orchestra, of which Mr. Strevens is the leader. The orchestra added much to the evening's enjoyment.

League of Nations.—Those who are interested in the League of Nations may be pleased to hear how they may spend a short holiday full of interest, in ideal surroundings, congenial companionship with no trouble in making arrangements and no concern whether it be wet or fine.

It was my good fortune, through a very prominent member of the League of Nations Union, to take part in the Easter School at St. Hilda's College, Oxford, a five-day holiday, which had only one drawback—it was much too short.

It was obvious that no trouble had been spared on the part of those responsible for organising the excellent arrangements, Mr. Judd with his well thought out and extremely interesting lectures, and Miss Tynan, the travel Secretary, for the splendid catering and accommodation provided.

There were approximately 150-200 members attending the school, representing peoples of many nations. Some were doctors of medicine or science, some students of our well-known colleges and many from colleges or universities abroad; and some, like myself, just a member anxious to learn more about the League and its progress.

Many well-known speakers who are giving up all for the cause came to give lectures, including Professor Gilbert Murray and Dr. Deissman.

L.T.S. Traffic Branch.

We extend hearty congratulations to Mr. P. J. Mantle upon his promotion to the rank of Superintendent, London Telephone Service.

We are pleased to learn that our colleague on the Traffic Branch, Capt. J. Webb, M.C., who left London to take up a position as Traffic Manager in the Egyptian State Telephone Service last year, has been appointed Inspector-General, Telegraphs and Telephones, in Egypt, and we extend to him our hearty congratulations.



Mr. S. W. Shearing.

The above photograph was crowded out of last month's issue, which contained a paragraph referring to Mr. Shearing's work (p. 167).

Victoria Exchange.

On Friday, April 10, the staff of the Victoria Exchange held a very successful social in aid of Bolingbroke Hospital. Mr. Legus kindly acted as M.C. An excellent band was provided and dancing enjoyed during the evening.

After the interval three members of the Dramatic Class gave a very good performance of the amusing sketch, "Between the Soup and the Savoury."

The staff showed their appreciation in the volume of applause which they gave. Good luck to them for their next venture.

Miss Buckwell and various members of the committee had also arranged perfumery, sweet and flower stalls and the staff and visitors responded with their usual generosity.

The social concluded at 10.30 and it has since transpired that the balance for the hospital amounts to £19.

The committee and helpers are to be congratulated on the success of the evening and its financial result.

Personalia.

Resignations on account of Marriage.

Assistant Supervisor, Class II.

Miss E. M. Johnston, of London Wall.

Telephonists.

Miss S. G. Mandy, of Tandem.	Miss E. H. Jones, of Victoria.
" I. C. E. Cunnell, of Streatham.	" E. Jones, of Trunk.
" E. M. Harrison, of North.	" L. M. Wiggins, of Trunk.
" H. Darbyshire, of North.	" B. Jackson, of Trunk.
" W. E. Morgan, of North.	" E. Moore, of Bishopsgate.
" M. Burchett, of Paddington.	" C. P. Allender, of Gerrard.
" E. M. Pady, of Hop.	" W. M. Leaver, of Clerkenwell.
" V. M. L. Gadd, of Putney.	" O. L. Hannaford, of Welbeck.
" M. Webster, of New Cross.	" I. E. Clark, of Central.
" H. M. Johnson, of Sidcup.	" L. M. Oakley, of Central.
" D. Fuller, of City.	" E. F. Durbidge, of Central.
" C. E. Stevens, of City.	" I. F. May, of Central.
" N. K. Kinsley, of Mill Hill.	" D. J. Webb, of Museum.
" C. M. Grace, of Tottenham.	" E. B. Sellman, of Avenue.
" A. I. Day, of Upminster.	" L. E. Sweetman, of London Wall.
" M. Martin, of Victoria.	" S. A. C. Smyth, of Terminus.

LONDON ENGINEERING DISTRICT NOTES.

THOSE whose business or pleasure takes them through the streets of London, can hardly fail to have noticed the signs of activity in the neighbourhood of some of the London Electric Railway Underground Stations. Work of this kind is going on at the present time at Marble Arch and Hyde Park Corner, where new underground booking halls and escalators are being constructed for the railway; and at Hammersmith Broadway and Knightsbridge, where similar work is being carried out in connexion with the extension of the railway. Operations of this nature invariably involve a considerable amount of alterations to the existing plant in the thoroughfares concerned, and among other undertakings the Department has to carry out extensive diversions of its underground services. For example, the work at Marble Arch necessitates the diversion of 41 cables, the building of two manholes and the fitting of ironwork in the latter and also in a subway which is being built by the railway contractors to accommodate the cables together with the recovery of all the existing plant. At Hyde Park Corner the Department's existing route has had to be diverted. In view of the traffic congestion at this important point the work had to be done during the Easter holidays, and consisted of laying 21 steel pipes across the road and building a manhole on the Artillery Memorial island. The remainder of the route is being completed by tunnelling under the road with 18 ducts from the island into Hyde Park, picking up the existing route inside the Park. A smaller work of this kind occurred at Ealing Common where the Underground Railway Company's Station is being enlarged. It was necessary to divert the Department's main underground route in the Uxbridge Road, 20 steel pipes being laid across the railway bridge for this purpose.

In connexion with the new Tube Railway which is being constructed in North London, extensive alterations will be required to the Department's plant at Manor House, Finsbury Park.

Retirement of Mr. H. M. Chambers.

Mr. Aspinall, Sectional Engineer, North West External Section, presided on Mar. 31 over a well-attended gathering of representatives from all parts of the District to say farewell to Mr. H. M. Chambers, Assistant Engineer, on the occasion of his retirement, owing to the age limit, after 43 years in the Telephone Service. Among those present were the Superintending Engineer (Mr. E. Gomersall), Mr. J. Brown, Asst. Superintending Engineer, and Messrs. Hammond, Mitton, and Dolton, Executive Engineers. Quite a number of those present spoke of their knowledge of the varied qualifications and accomplishments of Mr. Chambers, but one and all testified to his unflinching good humour and courtesy in dealing with the public and those who had served under him. On behalf of the staff, Mr. Gomersall presented Mr. Chambers with a gold watch, as a token of the esteem and affection in which their retiring comrade was held, and he voiced the wishes of all that he might live long with good health to enjoy his well-earned rest. Mr. Chambers

suitably replied, humorously remarking that he was overwhelmed by all the kind things that had been said about him, and said he could only hope they were on his appraisal form.

Duke of York's Cup.

We referred last month to the fact that the Duke of York's Cup for the best Departmental Sports Record for the year had been awarded to the London Engineering District. The presentation of the Cup was made on April 9 at Treasury Chambers, Whitehall, by Sir Warren Fisher, in the presence of the Civil Service Sports Executive Council. Mr. Gomersall received the Cup on behalf of the London Engineering District. Sir Warren Fisher, after reading out the formidable list of successes achieved by the Department in sport during 1930, congratulated the staff on being the first Post Office Department to win the Cup. Mr. Gomersall, in a few well chosen remarks, emphasised the fact that sport in the London Engineering District was only in its infancy, and that it was hoped to go on from strength to strength. In addition to Mr. Gomersall, the London Engineering District was represented by F. R. Gaby (Athletics), Amateur Hurdles Champion, English Representative, F. Brooman (Boxing), Amateur Welter Weight Champion 1930, P. K. Broomfield (Cricket), V. G. Leader (Football), and A. W. Kelly (Swimming).

The Duke of York has sent the following letter in connexion with the award of his Cup:—

[Copy.]

145, Piccadilly, W.1.

Mar. 27, 1931.

My dear Curtis-Bennett,

His Royal Highness the Duke of York was very interested to learn that his Cup for the outstanding performance by any Civil Service Department throughout the year has been won this year by the Post Office Engineers.

His Royal Highness would be grateful if you would convey to the members of that Department his sincere congratulations, and he is delighted to think that for the first time a Post Office Department has won his Trophy.

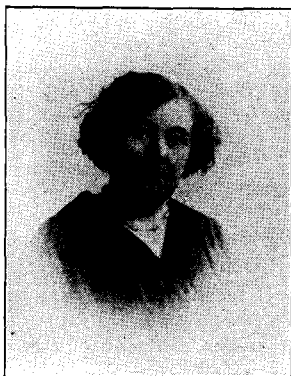
The Duke wishes the Post Office Engineers' Department another successful season in 1931.—Yours sincerely,

(Sgd.) B. V. BROOKE,
Comptroller.

N. Curtis-Bennett, Esq., C.V.O.,
Civil Service Sports Council,
Treasury Chambers, Whitehall, S.W.1.

LEEDS DISTRICT NOTES.

Retirement of Miss Chippendale.—Few items of news affecting the telephone service have created such interest in the local press as the retirement of Miss H. Chippendale, Supervisor of the Leeds Combined Trunk and Auto-manual Exchange. For 46 years Miss Chippendale has been identified as operator and supervisor with the Leeds telephone service, and the numerous letters of goodwill she received from subscribers when the news of her impending retirement became known indicated that, in spite of the coming of the automatic telephone, the "personal touch," which contributes so much to the smooth working of the service, had not been lost.



MISS CHIPPENDALE.

Miss Chippendale intends to make her future home near Adelaide, in Australia, and by the time these notes appear she should be nearing the end of her long sea voyage. A wonderful send-off was accorded to her by a large and representative gathering of past and present members of the staff at a social evening held at the Guildford Hotel on April 8. Col. Chambers, who was Provincial Superintendent of the Northern District in the days of the National Telephone Company, was present and entertained the company with some reminiscences of the days when he engaged Miss Chippendale (Chippy, as he called her) to operate the Hunslet Exchange, which was opened in 1885. Mr. Murray (District Manager), who was in the chair, and

Mr. Bownass (Assistant Postmaster), Mr. Lawrence (Traffic Superintendent), Miss Morfitt (Asst. Supervisor, Class I), Miss Newstead (Telephonist), Miss Jowett (representing the U.P.W.) and Mr. Tinney (Telegraphs) all gave expression to the esteem and affection in which Miss Chippendale was held; after which Col. Jayne (Postmaster-Surveyor), in a racy little speech sprinkled with anecdotes, presented Miss Chippendale, on behalf of the company, with a fitted dressing case, a picnic outfit and a morning tea set. Miss Chippendale was accorded musical honours on rising to reply, and after suitably expressing her thanks to the company drew from the storehouse of her knowledge and experience some useful maxims for those of the younger generation in whose keeping lies the future of the telephone service.

Promotions and Transfers.—Our congratulations and a hearty welcome to the district are tendered to Mr. C. Brocklesby on his promotion to be Assistant Superintending Engineer at Leeds. Mr. Brocklesby was previously Executive Engineer, Liverpool (Internal) Section.

We also congratulate Mr. H. B. Verity on his promotion to Higher Clerical Officer in the Accounts Branch, D.M.O., and Miss E. L. Morfitt and Miss L. Lowndes on their promotion to the positions of Supervisor and Assistant Supervisor, Class I, respectively, at the Leeds Exchange.

Mr. J. O. Walker, Assistant Traffic Superintendent, was the recipient of a gold wrist watch, suitably inscribed, from the Bradford and District Exchange and Engineering staffs on the occasion of his transfer from Bradford, where he had been Exchange Superintendent since 1926, to the Leeds Traffic Section. His place at Bradford has been taken by Mr. J. K. Rhodes.

Yet another change in the Traffic Section was occasioned by the departure of Mr. H. N. Pickering to join the N.E. Survey staff on trial as Assistant Surveyor, Class II. Mr. Pickering, who takes with him our best wishes for his success in his new sphere, was also given a silver cigarette case as a memento of 3 years' very pleasant association.

We also extend a hearty welcome to Mr. J. Baines, Assistant Engineer, who has come from the Engineer-in-Chief's Office to join the Sectional Engineer's Staff at Bradford.

BIRMINGHAM NOTES.

Birmingham Telephone Society.—The last of the series of lectures was held on Friday, Mar. 27 last, when a paper was given by Mr. G. F. Findley, A.M.I.E.E., on the "Birmingham Automatic Exchanges Transfer to Automatic Working." The lecture was inspired by remarks that had been overheard to the effect that it was not understood how it was possible for approximately 5,000 subscribers to be changed over from manual to automatic working in a short interval of two or three minutes.

Mr. Findley divided his lecture into three parts—Training, Testing and Transfer. It was well illustrated by lantern slides, which added to the interest and appreciation of the subject. The chair was taken by the Postmaster-Surveyor, Col. Brain, who, in congratulating Mr. Findley upon his paper, expressed his appreciation of the success of the lectures which had been arranged, and took the opportunity of drawing the attention of the staff to the Civil Service Sports movement and the need for its support.

At the conclusion the usual entertainment, which on this occasion was provided by the members of the Traffic Section, was of an exceptionally high order and was thoroughly enjoyed.

The Accounts Section.—Another successful meeting of the staff was held on the evening of April 2 last, when the paper was given by Mr. J. W. Grimsley, Clerical Officer, on the work in the Outstandings Section. Mr. Grimsley, who has had a long and exacting experience in the collection of outstanding accounts, especially county court work, upon which he is the recognised local authority, gave a most interesting paper and was warmly congratulated. The District Manager, Mr. J. L. Parry, was in the chair, and in the course of his remarks instanced some humorous cases in connexion with outstanding accounts work which had recently come under notice.

It is evident that these meetings are keenly looked forward to by the staff. The papers which have already been given have been exceptionally good and the subjects dealt with enable the staff, especially the younger members, to appreciate the details of the accounting work in the various sections.

Sport.—It has been decided to form a Cricket Club in the District Manager's Office. It will consist of members from the Accounts, Contract and Traffic Sections and will be run in connexion with the Civil Service Sports movement. The District Manager, Mr. J. L. Parry, is the President, and the Secretary is Mr. E. T. Vallance, Assistant Traffic Superintendent.

Promotions.—Mr. H. L. Halward, Clerical Officer, was, on April 3 last, presented with a barometer on the occasion of his promotion to the position of Higher Clerical Officer, Bristol. The District Manager, Mr. J. L. Parry, in making the presentation, congratulated Mr. Halward upon his well-merited promotion and expressed his confidence that Mr. Halward would be as successful in Bristol as he had been in Birmingham.

Mr. P. C. Ashley, Clerical Officer, Birmingham, who has been promoted to be a Higher Clerical Officer at Brighton, was presented with a cut glass rose bowl at a gathering of the staff on April 8 last. The District Manager, Mr. J. L. Parry, who made the presentation, referred to the high regard in which Mr. Ashley was held by the Birmingham staff, and wished him every success in his new district.

Mr. H. Scarborough, Assistant Traffic Superintendent, has left us to take up a position in the Headquarters Traffic Section. In presenting Mr. Scarborough with a silver cigarette case, umbrella, &c., the District Manager, Mr. J. L. Parry, said that Mr. Scarborough, who had been in Birmingham for about three years, had proved himself to be a most capable and popular officer, and that he would take with him the good wishes of his Birmingham colleagues. Mr. Scarborough was also presented with a suit case by the operating staff.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(Continued from page 144.)

1912, April 15 700 passengers saved as a result of a wireless call made by the S.S. *Titanic*, which sank after striking an iceberg.

1912, May 18 ... First experimental automatic telephone exchange installed in the United Kingdom opened for service at Epsom, Surrey. Equipment was of the Strowger two-wire type.

1912, June ... Baudots installed between London, and Milan and Havre.

1912, July ... International Radiotelegraphic Convention held in London.

1912, July 13 ... Automatic telephone exchange opened at the General Post Office, London, for connecting official departments. Siemens' high-speed automatic duplex printing telegraph introduced.

1912, Aug. ... Thorne-Baker Teletograph for transmitting photographs submitted to the Post Office.

Prince modified the Bellini-Tosi method of directional wireless reception.

Triple duplex Baudot, multiplex telegraph installed between London and Berlin.

1913, Jan. ... Drysdale-Tinsley alternate current potentiometer introduced.

Fraser, of the Eastern Telegraph Company, devised a keyboard tape perforator, a telegraph receiver on the lines of that of Baudot, and a telegraph printer similar to that of Creed.

Fraser, Wood and others patented a receiver-perforator which translates cable morse into wheatstone.

Judd and Fraser introduced an automatic transmitter for use with cable or wheatstone perforated tape.

1913, March 1 ... E. A. Meissner and C. S. Franklin eliminated loss in wireless transmitting and receiving circuits by reaction of the three-electrode valve.

Post Office (London) Railway Act provided £1,100,000 for building a Post Office underground tube railway for letters and parcels.

1913, Mar. 31 ... Post Office surplus during previous 12 months, £4,681,321.

"Holt" revision of pay, &c., in the Post Office took place.

International conference held to consider what steps should be taken to guard against accidental injury to cables.

Postmaster-General appointed a committee to consider the question of high-speed telegraphy.

H. W. Pendry published "The Baudot Printing Telegraph System."

1913, Aug. ... Betulander Automatic Telephone Company formed.

1913, Oct. ... Baudot telegraph installed on London-Hamburg and London-Genoa lines.

Anglo-Swiss telephone service established via Paris.

1913, Nov. 6 ... Sir William Preece died.

1914, Jan. ... London-Leipzig Hughes duplex telegraph opened.

1914, Feb. 1 ... Junction telephone service inaugurated between Liverpool and Manchester.

1914, Mar. 17 ... Morkrum-Kleinschmidt 5-unit printing telegraph patented. Vacuum tube system installed in Central Telegraph Office, London.

1914, Mar. 31 ... Post Office surplus during previous twelve months, £5,200,132.

Sextuple duplex Baudot multiplex telegraph installed between London and Birmingham.

Thermionic telephone repeaters used on overhead lines between New York and Chicago.

1914, April 12 ... Royal Society of Arts Albert Medal presented to Senatore G. Marconi.

Betulander and Palmgren, of Sweden, invented a new trunking system for automatic telephone working which made the use of relays possible.

1914, June ... *Punch* sent 30,000 reply-paid telegrams advertising a set of caricatures.

1914, July 24 ... Honorary G.C.V.O. conferred on G. Marconi.

1914, July 31 ... Germany cut Indo-Company's London-Karachi telegraph line.

1914, Aug. 1 ... Lorimer automatic telephone system put into service at Hereford.

1914, Aug. 3 ... Telegraph and telephone communication between Germany and Belgium ceased.

1914, Aug. 4 ... Telegraph communication between England and Germany ceased.

1914, Aug. 5 ... German cables to America cut.

Public service on Anglo-Continental telephone circuits suspended.

1914, Aug. 30 ... All London-Paris wires, via Calais and Boulogne-sur-Mer, interrupted.

1914, Sept. 7 ... British Pacific Cable cut at Fanning Island by the German cruiser *Nuernberg*. The cable was in full working order again on Oct. 30.

1914, Sept. 8 ... Sir John Henniker Heaton died.

Carl Kinsley revived the telegraph printer of Vavin and Fribourg and attained a speed of 325 w.p.m.

1914, Sept. 16 ... New cable laid between Beach Head and Nantes.

1914, Oct. 8 ... London-Antwerp telegraph communication ceased.

1914, Oct. 10 ... Cable laid between Dover and Dunkirk.

Western Electric rotary automatic telephone system, invented by Frank R. McBerty, put into service at Darlington.

1914, Nov. 9 ... German cruiser *Emden* destroyed the Cocos Island wireless station. Before the enemy reached the station a message was emitted which was received by H.M.A.S. *Sydney* and the *Melbourne*, and resulted in the *Emden* being placed out of action.

Fleming constructed a three-electrode valve with a spiral wire grid.

I. Langmuir produced hard thermionic valves and eliminated ionization.

William Aitken designed a system of tandem working for automatically routing calls in manual systems of telephony. Aitken invented many telephone switching systems and devices, and published a "Manual of the Telephone."

40,243 foreign and colonial telegraph money orders dealt with during the year.

1915, Jan. 19 ... Anglo-Russian cable completed.

1915, Jan. 28 ... Anglo-Russian cable opened.

Speech transmitted by wireless telephone in one direction between Arlington, U.S.A., and Eiffel Tower, Paris.

1915, Mar. 1 ... New York-San Francisco direct telephone circuit (3,400 miles) brought into use.

Quintuple duplex Baudot multiplex telegraph installed between London and Liverpool.

Thermionic repeaters used on an underground telephone circuit in Philadelphia.

Siemens automatic telephone system installed at Grimsby.

Irving Langmuir showed that emission of electrons from hot bodies did not require the presence of gas but could occur in a sensibly perfect vacuum.

Telephone meters for subscribers lines introduced.

1915, Mar. 31 ... Post Office surplus during previous 12 months, £3,544,254.

(To be continued.)

THE Telegraph and Telephone Journal.

VOL. XVII.

JUNE, 1931.

No. 195.

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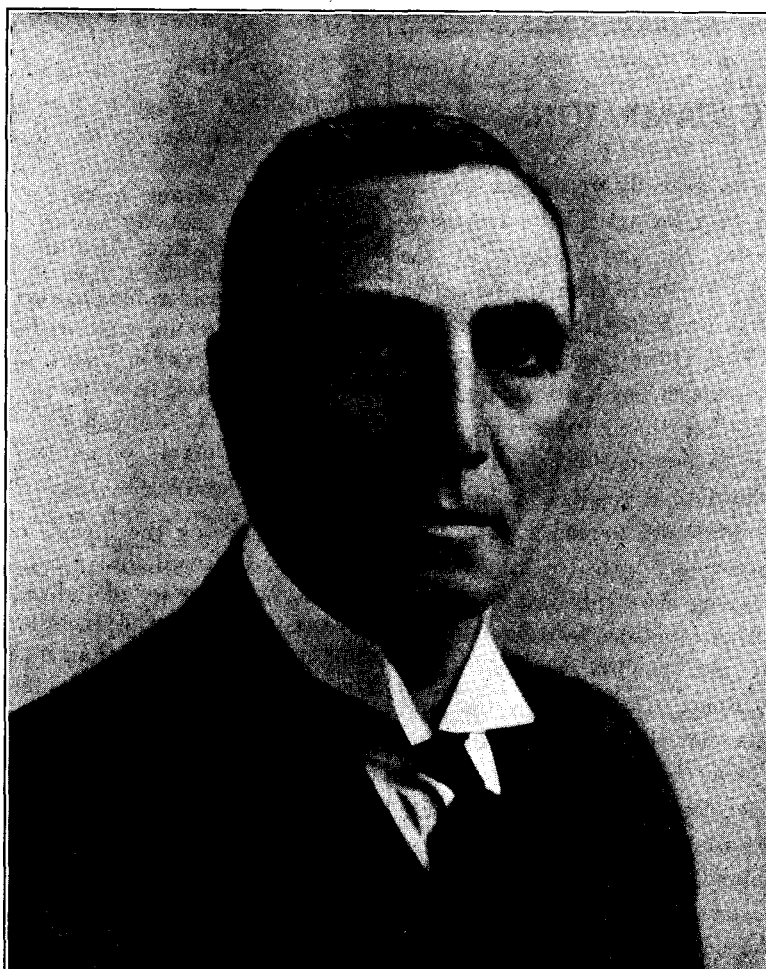
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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXXVII—MAJOR H. BROWN

MAJOR H. BROWN, who succeeded Mr. DeLattre as Assistant Engineer-in-Chief on his retirement in 1929, entered the Telegraph Service in 1890. After 6 years in the instrument room, he entered the Superintending Engineer's Office at Birmingham, being appointed Sub-Engineer at Coventry in 1900, and Second Class Engineer (in charge of the Stafford Section) in 1903. This appointment was followed by a transfer to the District Estimates Section, and thence to the Survey Section at Headquarters. Mr. Brown became a First Class Engineer in 1910, being then stationed at Belfast, and in the same year attended the International Telegraph and Telephone Conference at Paris, and was detailed for duty on the Inventory staff engaged on the complicated and exacting task of valuing the late National Telephone Co.'s plant which was about to be acquired by the State.

While in the Local Lines Section of the Engineer-in-Chief's Office, Mr. Brown was appointed Assistant Director



of Army Signals at Headquarters, with the rank of Captain, and later was given command of No. 5 Telegraph Construction Coy. in France. He was twice mentioned in despatches and was awarded the O.B.E.

On his return to England he was transferred to the Construction Section, and in 1927 went to Sweden to study the construction methods adopted in the country. He was promoted to be Superintending Engineer in charge of the North Midland District in 1928. During that year he paid an official visit to the United States to examine the organisation and construction methods followed in that country, and, indeed, may be regarded as a specialist on questions of engineering construction costs and methods of organisation. He was, as above stated, appointed Assistant Engineer-in-Chief in 1929.

Major Brown does not suffer fools or the inefficient gladly; but he is just, human, and rightly popular, for all know his sterling worth and that his gruff "sergeant-major voice" is bark and not bite.

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - -	{	Lieut.-Col. A. A. JAYNE.
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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVII.

JUNE, 1931.

No. 195.

THE CANVASSING CAMPAIGN.

THE Press on the whole gave a friendly reception to the Postmaster-General's announcement that an extended advertising and canvassing campaign to increase the development of the telephone service was being pursued. We have seen references to a "National Drive," a "Mass Attack on Phone-less Farmers" a "Boosting Campaign," and to a "Post Office Canvass of 750,000 People." The Postmaster-General's speech, with its figures and statistics and explanatory comments on them, were reproduced by those papers whose practice it is to provide fairly full reports of public proceedings, and so to afford their readers facilities for forming their own judgment. It is, no doubt, to such reports that the plain man instinctively and increasingly turns for information on matters of public importance, leaving the exuberant write-ups (or write-downs) of telephonic and other questions to those who are athirst for news of Titian-haired girl bandits or the rapid disentangling of connubial knots at Reno. Of these selective and tendentious articles and comments on the present telephone situation there is, of course, no lack. One of these, after overstating, in characteristic style, the telephone development per 100 inhabitants of the United States, and understating that of this country, proceeds: "There is no mystery about the reason for America's superiority of service. It is that her telephones are a private enterprise, run with commercial efficiency, while ours are a branch of a Government department." But the writer has already asked

himself 'bewilderedly,' "why our people should have lagged so seriously behind the march of modern progress. We have not fought shy of the motor car, &c., &c." He has not instanced a particularly fortunate case, because in the United States the number of motor cars is greater than the number of telephones, whilst in this country the number of motor cars (despite the fact that the industry is not State-owned) is smaller than the number of telephones." Further on we read: "*Poorly supplied*" (the writer is fond of italics) "*with telephones as Britain is, the Post Office at the present moment has 350,000 spare lines for which it cannot find subscribers.*" This grotesque idea of spare lines as something which an incompetent department cannot sell will amuse the telephone man though it may confuse the public. But we think even the layman appreciates the fact that it is impracticable to open the streets every time a new line is required, and that it is necessary to carry ample spare lines in all districts to make adequate provision for future subscribers. Other paragraphs, again, valiantly discarding the prop of inaccurate statistics, boldly allege ineffective and too-costly service, due to an easygoing and complacent officialism. In short, when in doubt they play the "dead hand." We hardly think that exaggerations of Great Britain's backwardness, vague allegations of inefficiency, and ill-informed belittling of steady effort in the campaign under discussion, will further the common object both of sincere critics and of the Post Office itself, namely, the extension and improvement of the telephone service. Needless to say we expect and welcome criticism which is constructive, and not mere propaganda directed against state-ownership.

In conclusion, we cannot do better than quote our American contemporary, *Telephony*, which, in commenting on the comparative stagnation in telephone development in their country, remarks:—

"Great Britain, however, reported a 6% gain in telephones for 1930, and nobody claims that business conditions are better over there than in the United States.

"To a considerable degree the difference is due to the fact that percentage gains are more easily shown in the British Isles because their telephone development is so far behind that of the United States, but it is also true that the British Post Office has been carrying on an aggressive campaign to extend the service. This activity undoubtedly largely accounts for the growth in the face of the dull business situation prevailing all over the world.

"As showing the increased use of telephone service in Great Britain, it is stated that more than 1,350,000,000 calls were made in 1930, an increase of 34,000,000 over the previous year. The increase in residential installations in London during the year was three times greater than the increase in new business connexions. The number of public call offices was increased by nearly 4,000, bringing the total number in the entire country to 33,855, of which 800 were new call centers in London alone. There were 177 new rural exchanges established in 1930.

"The logical conclusion, therefore, is that systematic effort to increase the number of telephone installations gets some results despite a general business depression. This is demonstrated not only in Great Britain but in certain sections of the United States, where telephone companies have conducted successful drives for the development of new business."

It may be added that not only did Great Britain report a 6% gain last year, but their increase fell only from 127,000 to 110,000, whereas that of the United States fell from 865,000 to about 1,000, that of Canada from 64,900 to 13,690, and that of Germany from 230,000 to 59,000.

HIC ET UBIQUE.

WE have received the May issue of *Magyar Posta* (the Hungarian official postal monthly), a handsome special volume of some 450 pages, celebrating the jubilee of the telephone in Hungary. It is illustrated by hundreds of photographs and diagrams of historical and technical interest, showing early and late forms of line construction, switchrooms, &c., and contains numerous portraits. There are historical and biographical articles of all kinds, descriptions of buildings, installations, statistics of Hungarian telephone development, and other interesting matter. There is a portrait of Edison with a lithographed statement by him that "Theodore Puskas was the first man in the world to suggest the central station for the telephone." The brothers Puskas were pioneers of the telephone in Hungary.

Two interesting major developments of the overseas telephone service took place in May. The first was the opening of a direct radio-telephone service between this country and Rio de Janeiro (charge for the first 3 minutes, £6). The second was the extension of the Anglo-European service to the principal towns in Roumania. The charge for a 3-minutes' day call between London and Bucharest is £1.

A Glasgow paper has made the astonishing discovery that though Glasgow can speak by telephone to 90% of the world's telephone subscribers, it cannot speak to 90% of Glasgow's inhabitants. This is a true saying. Even in far-famed New York and Chicago, only about 30% of the population have a telephone.

The *Yorkshire Telegraph*, in an article on popularising the telephone, truly says: "Large numbers of people who could afford the telephone are content to do without it because they have never formed the habit. The service grows in advantage as it grows numerically. We have no doubt the time will come when people will have the telephone laid on as inevitably as they have water. We curse the telephone from time to time when it disturbs our repose, but there are few social services which we would less readily be without. It ought really to be regarded as being as indispensable in the house as it is in business."

The *Manchester Guardian* says "It is difficult to imagine a sentimental attachment to a telephone number; but some people, it appears, not only imagine it but achieve it. Mr. J. T. Whitelaw, the District Manager of Telephones, told a representative that when telephones are changed over from manual to automatic working many changes of number are necessary, and many complaints about the changes come in.

The sentimental one, which usually runs, 'My grandfather first had that number, and my father had it after him, and I was hoping to pass it on to my son,' is more common in Manchester than in any other place of which Mr. Whitelaw has had experience.

Some of these subscribers seem to feel a genuine pang because they can't put the faithful old number out to end its days quietly in the paddock."

The following is a copy of a letter received by the Secretary in the English as she wrote:—

"I am righting to you to let you know as mis is working to Wireless seats 3 years with out a lices I now it is the truth as I uest to live with them and he take is kgulter to bed chard it the eltter light cumper where he works, and is Mis"

And the translation is:—

"I am writing to you to let you know as Mister is working two wireless sets three years without a licence. I know it is the truth as I used to live with them, and he takes his accumulator to be charged at the electric light company where he works and is Mister"

A *ridiculus mus* after over half a century's education grants !

Our local correspondent, says the *Electrical Review*, reports that the new auto-exchange equipment in Cairo will be opened this summer, and that the Government has decided to reduce the subscription rates, but at the same time will arrange to meter each circuit. As was reported in March, the towns of Port Said and Suez are to be converted from manual to automatic service. In the financial year 1931-32 a sum of £25,625 is to be devoted to carrying out this conversion which, it is hoped, will be brought into service at the beginning of 1933. The Heliopolis, near Cairo, manual exchange will also be enlarged and converted to automatic service.

The first automatic telephone exchange in Russia has recently been completed with 6,000 connexions in Rostov. Work is in hand on the establishment of five automatic stations in Moscow, with a total of 50,000 connexions.

PROMPT ACTION BY A NIGHT OPERATOR IN A BURGLARY CASE.

THE following instance of commendable promptitude on the part of a night operator at an outlying exchange within 15 miles of London, which led to the capture of some burglars, is worthy of record. At 10.20 on April 16 a signal was received on R— 349. On answering the signal a shout of "burglars" was heard and a noise as though a telephone was being smashed. The night operator at once got through to the R— police, but, as the sergeant was out on duty, he reported to the D— police, giving full particulars as to the whereabouts of the burglary. The D— police promised to send some officers along at once. The night operator then tried to get the attention of the P— police, but the officer here was also out, so the facts of the case were reported to the G— office one of the larger towns of the neighbourhood. The night operator then searched round for the R— police-sergeant by ringing up several call office circuits, and was successful in getting him at one of them. He then hurriedly reported the case to him, and the officer went along at once—with eminently successful results, as one of the burglars was caught and the telephone was found to be broken.

A message was received at the exchange the next morning from the D— police saying that they would like to thank the operator who dealt so intelligently with the call. Through his quickness in reporting the trouble, they were able to catch the burglars, and were very grateful for the help he gave them.

LONG DISTANCE TELEPHONY.

J. F. DARBY (*Headquarters Traffic Section*).

(VII.)

THE two previous articles have dealt in some detail with the American 'combined line and recording' system of operating long distance circuits. Much more could, of course, be written on the subject, but it is probable that sufficient information has been conveyed to readers, taking into account other publications on the subject which have been available during the last few months. It might not, however, be regarded as out of place at this stage to summarise the main features of the system which, it is considered, tend to produce such satisfactory results, from the points of view of speed and output. These features are set out below:—

- (a) The association of recording work with the actual attempt to complete the call. This feature
 - (i) eliminates the 'office drag' which arises from the transfer of tickets from record to control positions,
 - (ii) reduces the 'call value,' i.e., the amount of operating work involved is less in view of the fact that it is unnecessary to recall the calling subscriber on the majority of connexions,
 - (iii) creates, from the point of view of the recording operators, greater interest in the work, through the holding of the calling subscriber, while attempting to complete his order for a call; there is a very definite and continuous incentive to complete a call at the earliest possible moment.
- (b) The provision of a multiple of trunk circuits. This feature gives availability to a number of controlling operators and thereby reduces the unoccupied time of the circuits.
- (c) The provision of ancillary equipment, giving a number of repetitions of each calling signal on outward and inward positions, admits of team work to a high degree. In consequence, traffic is distributed amongst the operators in accordance with the class and importance of the calls handled; an operator is able to spend considerable time on a difficult call or handle a heavy load in the case of simple calls. Further, the co-ordination of staff to traffic is made simpler, and more economical staffing is possible in the less busy hours of the day as compared with conditions where the normal method of trunk signalling is employed.
- (d) The free use of alternative routing. This feature increases the 'carrying capacity' of the individual groups of circuits concerned.
- (e) The working of trunk circuits between two centres as a common both-way group. This feature contributes to better circuit loading.
- (f) The provision of routing and rate information on the switchboard. This feature expedites the disposal of traffic and also enables enquiries to be answered at once by the recording operator in many cases, thereby avoiding the delay involved in reference to another operator.
- (g) Certain trunk facilities and technical aids are provided which assist in the setting up of speedy connexions, viz.,
 - (i) Straightforward junction working.
 - (ii) Holding and re-ringing facilities.
 - (iii) Direct dialling and keying from trunk switchboards.
 - (iv) Speedy means for the insertion of repeaters.
 - (v) Flashing supervisory recall signals on cord circuits.
 - (vi) Overflow and re-order jacks on tandem boards.
 - (vii) Visual signals for indicating engaged or idle circuits.

- (viii) Distribution of tickets by means of pneumatic tubes at the larger offices.
- (ix) Ready means for the substitution or 'patching' of faulty circuits.
- (x) High impedance monitoring facilities.
- (h) The control of trunk traffic at the originating trunk centre. This feature
 - (i) provides the controlling operator with through signalling from the caller,
 - (ii) provides the caller with easy access to the controlling centre when he wishes to make enquiries,
 - (iii) avoids the reversal of connexions over long distances to the calling subscribers.
- (i) High standard of transmission maintenance.
- (j) Connexion of minor and local exchanges direct with a trunk centre. This feature helps to keep the number of switchings on indirect traffic to a minimum.
- (k) Specialisation on trunk work, good organisation of exchange routine work and subsidiary duties, and the development of a 'Spirit of Service.'

To turn now from the description of various operating methods in connexion with long distance telephony, it may be of some interest to consider the steps which have been taken to introduce the *demand* system of working in Great Britain, and the plans which have been formulated for the future.

LAYOUT OF SWITCHING CENTRES.

The first phase has been to review the general layout of the switching centres throughout the country as a whole. The matter has had to be considered from both traffic and engineering aspects. The question of the organisation of the plant layout will be dealt with in a later article, but it should be said, at this stage, that the system in force in Great Britain with *zone* and *group* centres is on lines identical with that in America, except that much has yet to be done in our country in connexion with the provision of direct circuits between minor and local exchanges on one hand and group centres on the other. This can only be achieved in stages, having due regard to economy and the improvement in service which is likely to be attained. It seems probable, however, that a number of additional group centres will be formed as the traffic develops and opportunity presents itself. Below is given a list of the additional group centres in contemplation.

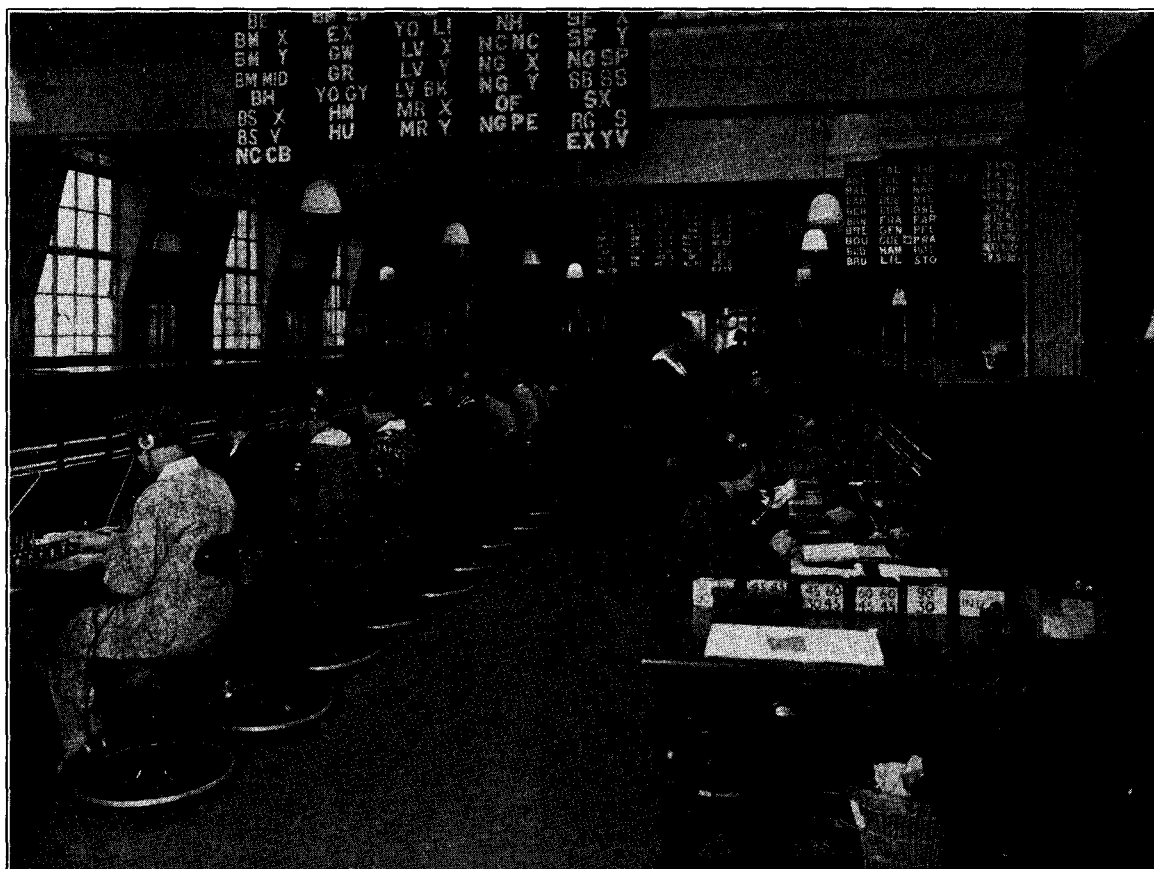
LONDON ZONE. Aldershot. Ashford. Aylesbury. Basingstoke. Chatham. Chelmsford. Chichester. Cranbrook. Dover.	LONDON ZONE. Folkestone. Hitchin. Littlehampton. Luton. Margate. Ramsgate. Southend-on-Sea. Winchester.	CAMBRIDGE ZONE. Bury St. Edmunds. Great Yarmouth. Lowestoft. Newmarket.	
BIRM'GHAM ZONE. Aberystwyth. Barmouth. Cheltenham. Coventry. Dudley. Kettering. Market Harb'r'gh. Melton Mowbray. Oakham. Rugby. Stafford. Walsall. Wolverh'pton. Worcester.	BRISTOL ZONE. Bridgwater. Devizes. Frome. Ilfracombe. Minehead. Torquay. Weymouth.	CARDIFF ZONE. Abergavenny. Brecon. Merthyr Tydvil. Pontypool. Pontypridd.	SWANSEA ZONE. Tenby.
GLASGOW ZONE. Ayr. Falkirk. Fort William. Oban. Stirling.	MANCHESTER ZONE. Bolton. Macclesfield. Rochdale. Warrington. Wigan.	LIVERPOOL ZONE. Bangor. Runcorn. St. Helens. Southport. Widnes.	LEEDS ZONE. Bradford. Dewsbury. Grimsby. Halifax. Huddersfield.
	ABERDEEN ZONE. Elgin.	EDINBURGH ZONE. Dunfermline. Kirkcaldy.	NEWCASTLE ZONE. Durham. Sunderland. West Hartlepool.
			SHEFFIELD ZONE. Barnsley.
			BELFAST ZONE. Omagh.

ACCOMMODATION PROBLEMS.

The second step has been to review the accommodation aspects at zone and group centres, and much progress in this direction has been made. Consideration has been given to the requirements of all trunk centres, and in many instances decisions have been arrived at regarding the housing of new trunk equipment. The position in London has naturally received attention first and reconstruction in the present G.P.O., South, building in Carter Lane will be carried out. To accomplish this, it has been necessary to transfer certain staffs and services to leased premises in the vicinity

outside the present building arises at the present time. In the case of Manchester a new trunk exchange on one of the upper floors of Telephone House, Chapel Street, is the course likely to be adopted. It is probable that at Liverpool and Glasgow the trunk service on a demand basis can be given in the existing building for several years with the likelihood of transfer to a new building in, say, 10 to 15 years' time—the matter is being further investigated.

At Cardiff and Swansea rebuilding schemes seem likely to be necessary within the next 4 or 5 years to house completely



SECTION OF NEW LONG DISTANCE POSITIONS, LONDON TRUNK EXCHANGE.

of Carter Lane, pending the completion of the new Queen Victoria Street building. In addition, the closing down and recovery of a section of the City exchange has been involved. By these means, a portion of the 5th floor (Bell Yard wing) has been released for the installation of 60 inland outward positions and the 4th floor annex will shortly be available for further suites of such positions. Space on the 3rd floor annex is about to be liberated for inland inward positions. Further, it has been found possible to clear a large portion of the 1st floor for a new *overseas* exchange to house the London ends of the circuits to Europe and other continents, and the installation of a suite of approximately 120 positions will commence as soon as redecorations involving the use of echo and noise suppressing materials have been carried out.

At Birmingham the scheme will be introduced in the present building; a completely new trunk exchange will, however, be provided as soon as it is possible to erect a new building. It is probable that a building on a site off Colmore Row will be erected to house not only a new Trunk but also a Toll exchange with two local automatic units.

At Bristol, Newcastle, Nottingham, and Leeds, provision for trunk working in the existing building seems possible for a considerable number of years, and no question of accommodation

reconstruction trunk exchanges. It is possible that some limited form of demand working will be undertaken in the existing switch-rooms in the meantime.

Altogether some 180 cases have been examined from an accommodation aspect and building plans have been modified to meet the new trunk demands in nearly 50 cases.

EQUIPMENT DESIGN.

The third step has involved the design of equipment, circuits, switchboard positions and associated engineering plant to meet the conditions existing in Great Britain, and allow the change over to be carried out with the least cost and minimum disturbance, having due regard to speed. Coupled with this step has been the compilation of traffic data for the initial installations.

It is proposed in the next article on the subject of Long Distance Telephony to give details of the trunk equipment developments. It can, however, be stated, now, that the first suite of demand positions—60 in number—(to be used for a few months as record positions only) was brought into use on May 9th in the G.P.O., South Building, London. An illustration is given of a section of these positions.

(To be continued.)

THE ENGINEERING AND TRAFFIC ASPECTS OF TELEPRINTER DEVELOPMENT.*

BY A. P. OGILVIE (*Headquarters Traffic, Secretary's Office*) AND
F. W. DORSON (*Engineer-in-Chief's Office*).

SECTION II.

TRAFFIC ASPECTS OF TELEPRINTER WORKING.

In reviewing the traffic aspects of Teleprinter working it will only be possible to refer to a few salient features which have been selected because of their general interest and appeal.

The Teleprinter, when tried originally in the British Telegraph Service, was not expected to do more than fill the gap between multiplex working on busy routes and morse working on lightly loaded circuits. A traffic load of from 400 to 600 telegrams daily appeared to constitute the normal limits between which Teleprinter working would prove effective and economical. It is significant to note that the policy now followed aims at the conversion of all routes, multiplex or morse, on which a daily load of 150 telegrams is exceeded.

The relative progress made in equipping circuits with Teleprinters during the past nine years is shown in the following schedule :—

Year.	Circuits Equipped.			Teleprinters.		
	No. 1a.	No. 2a.	No. 3a.	No. 1a.	No. 2a.	No. 3a.
1922	3	—	—
1925	27	—	—
1926	26	2	—
1927	—	—	2
1928	29	20	32
1930	—	—	350
1931 (prospective)	—	—	650

A comparison of the proportions of traffic carried on the various systems in 1927 and in 1930 (Fig. 8) conveys a vivid impression of the changing conditions. The effect of the gradual extension of telephone-telegram working, together with that of Teleprinter development, will, as may be noted, ultimately lead to the extinction of morse.

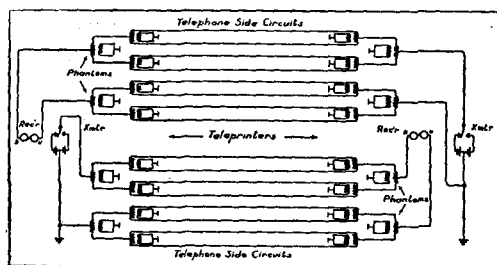


FIG. 7A.

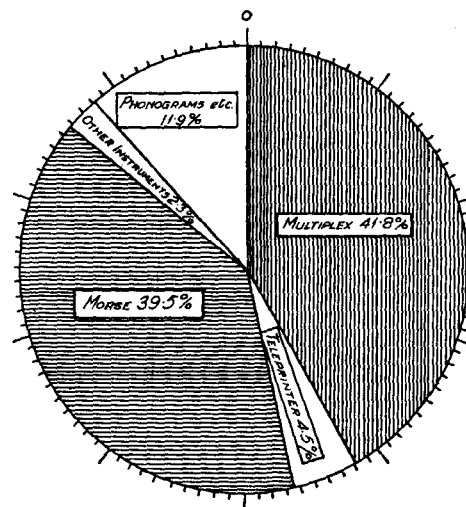
DOUBLE SUPER-POSITION AS DESCRIBED ON P. 177 OF MAY ISSUE.

These indications of progressive development naturally call for explanation and justification. What is there in the Teleprinter, you may ask, which makes it preferable to other systems for traffic purposes? It is an excellent combination of typekeyboard transmitter and tape printing receiver, but these facilities are available in other machines. The use of the "start-stop" principle has undoubtedly been an important factor without, however, explaining convincingly the reason for Teleprinter pre-eminence. I think if I were restricted to an answer of one word I should choose "Ubiquity" as the word best expressing the outstanding characteristic of the machine. Its completeness and mobility, its speed and stability, all combine to satisfy readily a variety of traffic and staff conditions. One feature of particular appeal to the operator is that it affords direct transmission and reception. The fact that a message signalled on the keyboard is reproduced on the distant printer immediately and can be attended to at once may not seem to be a feature of much significance, but psychologically it brings the operators at both terminals of the circuit into closer personal association than is possible on other typekeyboard systems, and in everyday practice this encourages a sense of friendly confidence happily productive of good working conditions.

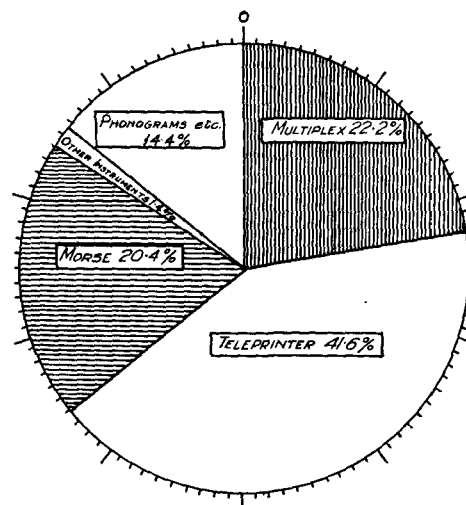
The speed of the Teleprinter, or rather the speed at which it is operated, is also a fundamental factor of importance. While a maximum speed of 60 words is available, in reckoning effective operating speed a reduction of 10% has to be made for the timing and numbering of telegrams, preparatory to signalling. Up to 60 words a minute the keyboard is "free," that is to say, it may be worked by an operator depressing keys at any speed up to that maximum. Beyond 60 words a minute, however, locking mechanism

of the keyboard prevents one key from being depressed too rapidly after another. There is understood to be no technical difficulty in gearing the Teleprinter speed higher, and it may reasonably be asked why, in the circumstances, operating speed is so restricted, especially as it is possible for a touch typist to work faster on a free keyboard, like that of a typewriter. Briefly, the answer is, a desire for accuracy and stability. The secret of clean, accurate typekeyboard working lies in the maintenance of a steady rhythmic speed and experience of both types of keyboard has demonstrated

APRIL 1927.



Nov. 1930.



Proportions of Telegraph transactions dealt with on Teleprinters, etc.,
1927-1930.

FIG. 8.

the interesting fact that on a keyboard locking at a reasonably high speed operators are forced to acquire and maintain a rhythm which is of considerable value in the production of accurate work. The industrial psychologist would probably explain the phenomenon by pointing to the fact that in such conditions a qualified operator maintains a margin of potential skill in reserve sufficient to eliminate strain and promote a high degree of concentration on the details of the work. Having, therefore, determined that a maximum speed of 60 words a minute is acceptable from a traffic point of view, no advantage would be gained in raising it at the expense of disproportionate wear and tear in machinery and a reduction in the signalling margin on long circuits. In my opinion a wise course has been followed in standardising the Teleprinter speed at the lowest point consistent with satisfactory traffic output.

In ordinary day-to-day conditions with a normal rise and fall of traffic throughout the 12 working hours, a duplex Teleprinter circuit is found to be capable of carrying a load of from 750 to 850 telegrams daily and channels are usually provided on that basis. During periods of heavy pressure, of course, when a steady supply of telegrams is available over a greater part of the working day, suitable conditions exist for measuring what may be

* Paper read before the Telephone and Telegraph Society of London.

termed the maximum traffic capacity of the apparatus, and on exceptional occasions such as those experienced on days preceding Bank Holidays much higher traffic totals are obtained. The traffic then dealt with is admittedly largely of a social character, but making due allowance for that characteristic it is considered the circuit loads shown in the following schedule may be accepted as typical maximum circuit loads.

Daily Totals of 1,000 or more Telegrams Transmitted over Teleprinter Circuits, Aug. 2, 1930.

Circuit.	F.	R.	Total.	Circuit.	F.	R.	Total.
TS—Brighton No. 1	762	828	1,590	BM—Brighton	322	765	1,087
TS—Portsmouth No. 1	625	845	1,470	LV—Llandudno	467	615	1,082
TS—Bristol ... No. 1	636	791	1,427	MR—Preston ...	517	546	1,063
MR—Blackpool No. 1	590	748	1,338	TS—Luton ...	705	337	1,043
TS—Brighton No. 2	558	701	1,259	TS—Manchester	486	555	1,041
TS—Southend ...	509	720	1,229	TS—Colchester	519	520	1,039
TS—Aldershot ...	599	578	1,177	BS—Torquay ...	324	714	1,038
TS—Portsmouth No. 2	547	626	1,173	BM—Derby ...	624	402	1,026
TS—Ipswich ... No. 1	656	509	1,165	BM—Cardiff ...	475	533	1,008
TS—Glasgow ... No. 1	571	562	1,133				
Bristol—Exeter ...	505	625	1,130				
BM—Northampton ...	754	375	1,129				
BS—Weymouth ...	407	714	1,121				
TS—Oxford ... No. 1	519	591	1,110				
TS—Folkestone ...	441	664	1,105				

Busy Hour Totals on Duplex and Simplex-Duplex Circuits, Aug. 1/2, 1930.

Circuit.	F.	R.	Total.	Circuit.	F.	R.	Total.
DUPLEX.				SIMPLEX-DUPLEX.			
TS—Portsmouth No. 2	64	92	156	Bristol—Taunton	48	73	121
GW—Edinburgh No. 2	74	104	178	BM—Shrewsbury	38	62	100
TS—Sheffield ...	70	91	161	BS—Swansea ...	46	52	98
*LS—Newcastle-on-Tyne	103	106	209	EH—Perth ...	34	62	96
				CF—Aberystwyth	44	48	92
				BM—Nottingham	55	37	92
				BS—Weston-			
				super-Maro	37	53	90

*7/6/30.

As similar results are obtained without special staffing or exceptional effort it is reasonable to claim that in favourable conditions a duplex Teleprinter circuit is capable of carrying over 1,000 telegrams in a working day of 12 hours.

MAXIMUM HOURLY OUTPUT

No of occasions recorded when individual output exceeded 80 telegrams an hour, April - Sept. 1930.

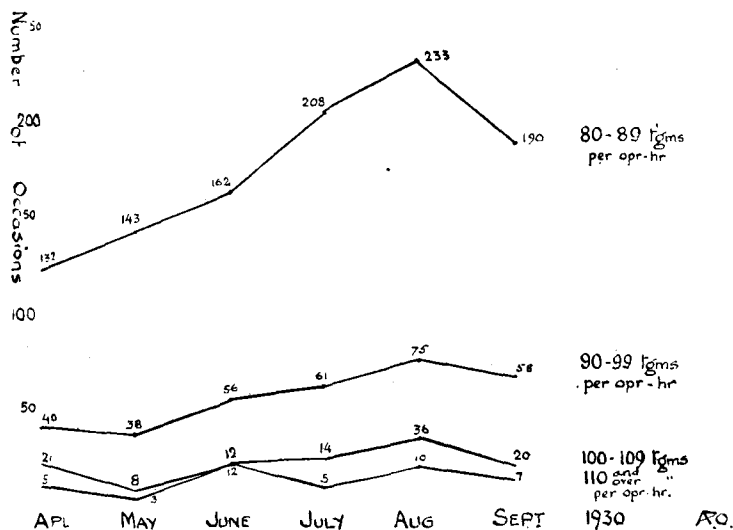


FIG. 9.

Referring to the lower schedule of duplex busy-hour totals, representing the work of two operators at each terminal of the circuit, it will be seen that as many as 209 telegrams have been dealt with in one hour on a Newcastle-Leeds circuit. This is believed to be a record total for a duplex channel.

The results headed "simplex-duplex" represent the busy hour output of circuits staffed by one operator at each terminal. "Simplex-duplex" is a term used to describe a procedure which has replaced the old system known as "up and down" working. It will be appreciated that on morse circuits the whole attention of an operator is concentrated on translating

received signals, while the distant operator is sending. On typeprinting systems, and notably in the case of the Teleprinter, however, it is possible when the circuit is arranged for duplex working for an operator at each office to send simultaneously, the received signals being recorded by the respective printers. This facility is taken advantage of in simplex-duplex procedure. Either operator is free to signal up to a maximum of five telegrams irrespective of what the distant operator is doing. Then any telegrams received are dealt with and cleared before signalling is again resumed. Thus, both operators may be signalling to one another for a period; or one may be sending and the other receiving, or both may be dealing with received work, according to the number and length of telegrams at the respective offices. The flexibility of the procedure has done much to improve the efficiency of single-operator circuits as the results shown in the schedule indicate.

QUALITY OF SERVICE before and after conversion to Teleprinter.

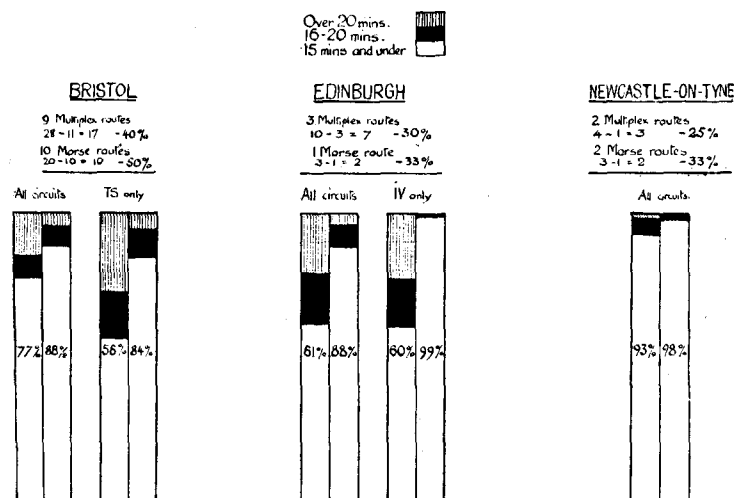


FIG. 10.

An interesting study of the number of occasions individual totals of 80 telegrams per hour have been exceeded over a period of six months is shown at Fig. 9. It should perhaps be explained that these results do not include every occasion on which similar outputs have been obtained as only the maximum hour each day at the offices concerned has been recorded and in many instances outputs of more than 80 were attained in successive hours on one day.

A valuable feature of this graph is that it indicates the point at which an increase of traffic at the circuit ceases to affect output; in other words, it is a measure of the average operator's ability to respond to a rising traffic. Hourly totals above 90 telegrams appear to be more dependent at present on manipulative skill than do totals below that figure.

It is outside the scope of these notes to deal exhaustively with the economics of Teleprinter development but a reference to their traffic basis may be acceptable. The conversion of a sounder circuit to Teleprinter working presents little difficulty as it means the replacement of a comparatively slow system by one capable of more than double the output, and in practically every case a saving in staff hours can be effected. In addition, line costs are generally lower. On the debit side an increase in annual apparatus charges has to be met but this is a comparatively small sum compared with other charges involved. The supersession of morse is therefore a simple economic proposition. What does not appear to be so obvious is the case for multiplex conversion. By means of multiplex apparatus four duplex channels on one line or loop can deal with a considerable volume of traffic. When, however, mechanical or electrical disturbances are experienced involving a collapse of the whole system the dislocation to traffic and staffing arrangements is serious. This feature of multiplex often referred to as "putting too many eggs in one basket," constitutes a weakness from the traffic point of view, and controlling officers responsible for the actual disposal of the traffic have found it essential to supplement multiplex outlets by means of standby or emergency circuits. The theoretical line saving aspect of multiplex is thus materially modified in practice, and, in considering a working circuit, an emergency circuit, and sometimes a reserve line, has made it easy in many cases to establish three independent Teleprinter duplex outlets without incurring additional line costs. A maximum operating speed of 180 words a minute in each direction is thus afforded which compares favourably with 120 words a minute on four multiplex channels. Moreover, better traffic conditions are established as disturbances are restricted in their effect to the single circuit affected.

Representative of the improvement so effected are statistics from three offices summarised in graph form (Fig. 10) which show the quality of service obtained on certain routes before and after conversion to Teleprinter. An

improved quality of service is recorded in each case combined with a substantial reduction in the number of working channels required, as an increased load is now carried at each operating position. The multiplex and Morse route particulars included under each office headings show (a) the number of channels previously worked, (b) the number ceased on conversion and (c) the resultant channels equipped with Teleprinters, together with the channel reductions expressed as a percentage. These changes are, naturally, affecting the size of Instrument Rooms and much valuable accommodation is being released for other purposes.

The attainment and maintenance of a high standard of working stability has been the object of much attention during the past few years. Weekly circuit records are kept of all stoppages and are examined at Headquarters. General weaknesses so revealed can thus be dealt with comprehensively and with a minimum of delay.

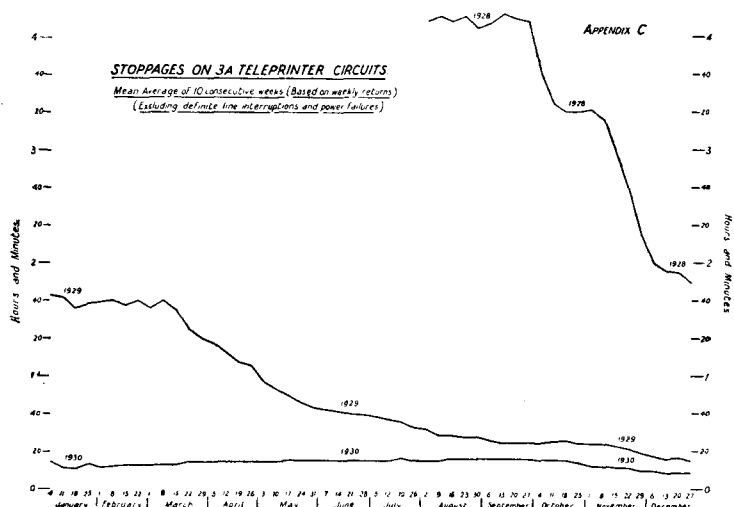


FIG. 11.

A graph (Fig. 11) showing the "traffic time lost" curve for Teleprinter No. 3A circuits since their introduction may be taken as a general index of the improvement in maintenance effected within the past 2½ years. The curve represents a mean average for the preceding ten weeks. At the beginning of August, 1928, this mean average exceeded 4 hours per circuit weekly, but within 12 months it had been reduced to little more than 30 minutes weekly; at present it maintains a steady level around 10 minutes weekly. These figures do not purport to represent the actual time faulty machines are out of use; what they do indicate are the periods of apparatus interruption which involve delay to traffic. When communication is re-established by the replacement of a faulty machine, or by the removal of a simple fault the "time lost" period ceases. The provision of reserve apparatus has therefore an important bearing on the results obtained.

Reserve machines are now allotted on a basis of one for every four working sets and the first reserve is always supplied when one working circuit is established. Accordingly at the smaller offices there is a duplicate set but as it is at such offices difficulty is experienced in arranging for continuous maintenance the additional expense is warranted on service grounds. Moreover, at many offices reserve sets are brought into use to equip additional outlets for the disposal of press telegrams in connexion with football and other similar events. Indeed, at the larger offices the existence of reserve machines and positions is proving of considerable advantage in meeting demands for additional facilities, consequently, Wheatstone working is now seldom resorted to either for special events or in emergencies.

Another factor which has helped to improve working stability is the training of members of the supervising and operating staffs in running adjustments at the Headquarters Teleprinter School. These officers, on return to their respective offices, form the nucleus of a maintenance staff for attending to minor difficulties. The formation of testing and maintenance groups of specially trained and highly skilled operators capable of more elaborate adjustments, which was recommended by the Simon Commission, is at present under consideration.

A passing reference should perhaps be made to the displacement of Wheatstone. A slump in the amount of press traffic handled by the Post Office a few years ago seriously curtailed the loads carried on such circuits and since then their fate has been sealed by the increasing use of Teleprinters for the transmission of press. The principal press traffic distributive routes in the Central Telegraph Office serving Birmingham, Liverpool and Manchester in one group, and Newcastle-on-Tyne, Edinburgh and Glasgow in the other, have been converted from Wheatstone to Column Teleprinter with excellent results. The preliminary preparation of tape, its transmission, reperforation, printing and gumming, all operations involved in Wheatstone working have been replaced by direct transmission and printing. In consequence, the transit time of press items handled on these circuits has been reduced by at least 15 minutes and substantial savings in other directions have been realised.

Progress is also being made in developing Teleprinter working at special events and an extensive programme has been arranged for the approaching flat racing season. Action in this direction is becoming imperative owing to a decline in the Wheatstone qualifications of the staff. The perforation of tape by means of stick punchers is seldom if ever required in the ordinary course of duty nowadays, and while senior operators are losing speed by reason of lack of practice, post-war operators are not obtaining opportunities to attain a satisfactory standard of efficiency.

These reflections lead naturally to the subject of training. The introduction of Teleprinter, by making possible the standardisation of apparatus to a degree never before contemplated, has had a remarkable effect on the duration and extent of training. A telegraphist in a large office in the early post-war period was expected to have a knowledge of Morse, Baudot, typekeyboard working and Wheatstone punching, all distinctive operations involving different alphabets and different forms of manipulation. In future manipulative skill will be confined to and standardised on the typewriter and telegraph typekeyboard. This will mean an immense gain in time and effort.

Already a revised training scheme for probationary telegraphists has been promulgated in which instruction will be concentrated mainly on the production of typekeyboard operators possessed of a high degree of touch-typing skill within six months of their commencing training.

During the present transitory stage the training of existing staff in Teleprinter working at large and small offices is being carried out on a well organised basis. A corps of specially-trained instructors drawn from the Central Telegraph Office and Provincial Zone Centres are employed on this work continuously and much of the credit for the present high standard of typekeyboard operating is due to the commendable zeal and enthusiasm of these officers. Considerable importance is attached to the acquisition of scientific touch typing methods and I think it can be claimed that there is more genuine touch typing amongst operators in the telegraph service at the present time than amongst typists generally.

Fig. 12 shows the average number of hours taken by operators in different age categories to reach a tentative qualifying standard of 25 telegrams in 30 minutes and it is specially interesting because of the successful results obtained with men and women over 50 years of age. Several seniors in this category were within three years of pensionable age when they creditably tackled the new training and succeeded in reaching the qualifying standard. These results confirm the accepted impression that women, generally, are more responsive than men of a similar age to training in typekeyboard manipulation.

These few notes should not, perhaps, be concluded without considering the effect of modern manipulative methods on the operator. While I share the regrets of many telegraph men at the passing of Morse, I do so on

TELEPRINTER TRAINING

Average training time (in hours) to attain standard of 25 telegrams in 30 minutes.
Based on results of 84 offices - 705 operators.

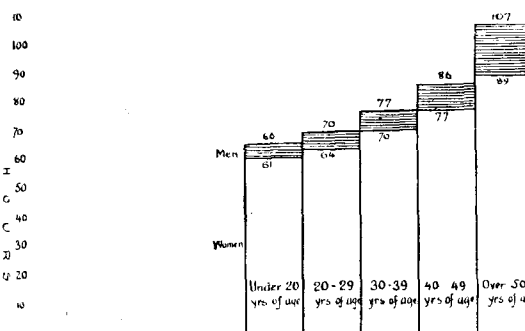


FIG. 12.

sentimental grounds only. Morse sending and reception is particularly exacting to individuals not constitutionally built to withstand the unbalanced arm and wrist movements, and cramp is always a possibility. With Teleprinters, on the other hand, both arms and all fingers are brought into use, digital effort is reduced to a minimum, and the posture of the body is erect, natural and comfortable. The work of gumming on the receiving side of a circuit also offers a marked change of movement. It is not suggested that Teleprinter operating is effortless; it does, however, compare very favourably with manipulation on older systems with the further advantage that efficiency can be maintained at a high standard without fear of premature breakdown. I am tempted in this connexion to quote briefly from an article published recently in a staff journal:—

"At one time elderly officers preferred morse to typekeyboard working. Then they got their chance to pass out by qualifying. They qualified. An interesting psychological result followed. The instrument they once dreaded they now like."

Finally, it may be appropriate to touch on the future possibilities of the Teleprinter Exchange system, in view of the proposal to establish an exchange in London at an early date.

A primary function of the system will be to provide intercommunication between private Teleprinter renters within a prescribed area by switching one renter through to any other connected with the exchange. A distinctive Teleprinter combining a transmitter keyboard and a column printer in one unit is being produced for this purpose. A feature of the machine is the inclusion of a device which automatically transmits the renter's Teleprinter exchange number in response to the depression of a "Who are you" key from the other renter's machine. By this means the accuracy of the connexion set up can be confirmed in both directions before the channel is used for business purposes.

In addition to local intercommunication it is intended that the Exchange system will be made use of by renters for the purpose of passing telegrams to the Post Office for transmission. In the early stages of development these connexions will be confined to the local area but it seems a short step further to the provision of Teleprinter channels to the principal provincial centres. When this is done a London Teleprinter renter could ask for, say, Liverpool or Glasgow and obtain connexion with the Head Post Office at either of these towns as readily as with the Central Telegraph Office. It would thus be possible for Teleprinter messages to be transmitted direct by the sender to the office of destination for local delivery. Provided that such a service were offered at an attractive tariff based on channel use and not on the number of words transmitted it would, I believe, make an instant appeal. Not only so, it would enhance the value of the Teleprinter exchange to an existing renter and stimulate the establishment of Exchanges at other centres.

There is also the possibility of Teleprinter intercommunication between Post Offices within a restricted area. Personally, I am doubtful of the financial basis of this aspect of the subject but the whole matter is receiving earnest attention and study. Whatever may be the exact course of development one can, with little imagination, foresee the Teleprinter occupying an important position in the future of the new Telegraphy.

PROGRESS OF THE TELEPHONE SYSTEM.

THE following gives a brief review of the growth in the telephone system during the past financial year.

The total number of stations working in the Post Office system at Mar. 31, 1931, was 1,982,171, the net increase for the year being 100,061, or 5.3%.

The growth for the year in London, England and Wales (excluding London), Scotland, and Northern Ireland, was as follows:—

	Total number of stations at Mar. 31.		Increase.	
	1930.	1931.	No.	%
London	675,783	712,493	36,710	5.4
England & Wales (ex- cluding London) ...	1,016,869	1,071,350	54,481	5.4
Scotland	166,184	173,416	7,232	4.4
Northern Ireland ...	23,274	24,912	1,638	7.0
Total	1,882,110	1,982,171	100,061	5.3

Residence rate installations at Mar. 31, 1931, numbered 464,585, the increase during the year being 37,043, or 8.7%. The London total increased from 167,122 to 181,789, and the provincial total from 260,420 to 282,796. At Mar. 31 last the percentage of residence to total exchange subscribers was 50.4% for London, 36.1% for the provinces, and 40.6% for the country as a whole, compared with 48.9%, 34.8%, and 39.2% respectively a year previously, and 30.5%, 22.8%, and 25.1% respectively at July 1, 1922, when the lower tariff for residence subscribers was introduced.

At Mar. 31 last, the total number of call offices (including kiosks) was 34,618, of which 6,872 were in the London Telephone Area and 27,746 in the provinces. The net addition during the year was 3,527 or 11.3%, which compares with 5,227, or 20.2%, and 1810, or 7.5%, for the years 1929-30 and 1928-29 respectively. The comparatively high rate of increase in the two last financial years was mainly due to the progress made under the scheme for the extension of telephone facilities in rural areas, inaugurated as a result of the proposals contained in the 1929 Budget. The number of call offices in rural areas (included in the above figure of 34,618) at Mar. 31 last was 10,522, which is nearly double the number at Mar. 31, 1929 (viz. 5,877).

Of the net addition of 3,527 call offices for the year, 2,215 (63%) were kiosk call offices. At Mar. 31 last kiosks in London numbered 2,301 and in the provinces 7,954, giving a total of 10,255, which represents a 28% increase for the year.

During the twelve months ended March, 1931, 183 new exchanges were opened under the rural development scheme of 1922, bringing the total number of exchanges opened since the inception of the scheme up to 1,590. In addition to the 1,590 exchanges opened, there were at Mar. 31 last 123 others in course of construction.

In the last two years most of the new rural exchanges opened have been of the rural automatic type, and the number of exchanges of this type at Mar. 31 last was 360.

In addition to the 360 rural automatic exchanges, there were at Mar. 31 last 220 exchanges of the full automatic type, making the total number of automatic exchanges 580, which compares with 307 a year previously. At Mar. 31 last, one-fourth of the subscribers in the Post Office system were served by automatic exchanges.

The total number of exchanges (urban and manual) working at Mar. 31 1931 was 4,886, of which 1,526 serve urban districts and 3,360 rural districts. The number of exchange lines connected with the former was 1,119,812 and with the latter 142,123.

The number of rural party line stations working at Mar. 31 1931 was 9,146, as compared with 10,105 at Mar. 31, 1930. The reduction in rural party line stations is largely due to their replacement by exclusive lines in connexion with the opening of rural automatic exchanges.

Further progress was made during the year in connecting rural railway stations with the telephone exchange system, and at Mar. 31 last, 51% of the rural railway stations were provided with exchange connexions, as compared with 42% a year previously. The numbers of rural railway stations connected at Mar. 31, 1930 and 1931 were 1,631 and 1,974 respectively, and all the new circuits (except one) provided during the year were call office circuits.

The number of effective calls originated during the year 1930-31 is estimated at 1,371 millions or 49 millions (3.7%) more than the total for the previous financial year.

At the time of going to press, the final results for the last two months of the year 1930-31 in respect of trunk calls were not available, and the year's figures will be given in a later issue. Particulars of the January 1931 traffic, which have not yet been quoted, are as follows:—

The total number of inland calls dealt with was 10,082,916, representing an increase of 461,120, or 4.8% on the January 1930 total. Outgoing international calls numbered 44,802 and incoming international calls 49,047, as compared with 46,330 and 50,231 in January, 1930.

Further progress was made during the month of April with the development of the local exchange system. New exchanges opened included the following:—

PROVINCES—Ashford (Middx.), Wokingham (both manual); Bridgerule (Holsworthy), Burwell (Newmarket), Bangor-on-Dee (Wrexham), Branscombe (Seaton), Basildon (Billericay), Burton Agnes (Bridlington), Burton-on-Stather (Scunthorpe), Cummertrees (Annan), Escrick (York), Foreside (Forfar), Faulkland (Radstock), Great Gransden (Sandy), Huggate (Pocklington), Knarr Cross (Peterboro), Llandegla (Ruthin), Risegate (Spalding), Ripley (Harrogate), Shenley Church End (Leighton Buzzard), Sutterton (Boston), Timberscombe (Minehead) (all rural automatic);

and among the more important exchanges extended were:—

PROVINCES—Ascot, Hoddesdon, Huddersfield, Slough, Truro (all manual); Southampton (automatic).

During the month the following additions to the main underground system were completed and brought into use:—

Leeds—Huddersfield,
Bristol—Trowbridge,
Broadford—Cranleigh,
Jctn. Coltishaw—St. Faiths (section of Norwich—Cromer cable);

while 70 new overhead trunk circuits were completed, and 72 additional circuits were provided by means of spare wires in underground cables.

TELEGRAPHIC MEMORABILIA.

WE, of the British Post Office generally and of the Telegraph Section more particularly, are much indebted to the *Telegraph and Telephone Age* for the following pat-on-the-back which appeared in one of the recent issues of our esteemed American contemporary. It is to be found under "Editorial Comment," where the editor informs his readers of what we are too shy to tell even our own people, viz., "that the General Post Office, London, England, is the first government institution in the world to build an exchange to be used in transmitting messages by the unique telephone-typewriter." No diffidence on this side of the Atlantic, however, shall prevent the placing on record of the keenest appreciation of this very welcome acknowledgment of our cousins across the sea.

Yet another! *The Electrical Review*, in referring to the coming Centenary Celebrations, congratulates the Post Office on a post-card franked "Faraday Centenary Celebrations, September, 1931," and adds that the Post Office "is so often regarded as a legitimate scapegoat, that it is with pleasure we record this touch of imagination on the part of the authorities. After all," continues the editor, "the Post Office owes as much to Faraday as any other body in the electrical industry, and it has given a president to the Institution of Electrical Engineers no later than 1929-30." Add to this the sanctioning, almost without a murmur, by the present Parliament of, in round figures, thirty millions of money for telephone development and something in seven figures for telegraphic improvements, and it will be difficult for some of us to maintain that extreme degree of shyness for which British Post Office officialdom is apparently credited.

Personal.—On May 1 last, at his office at Holborn Viaduct, Sir George Sutton was presented with a gold casket, to celebrate the completion of fifty years' service with W. T. Henley's Telegraph Works Co., Ltd. The casket bore an inscription of Sir George's coat of arms, and on the top a replica of the trade mark of the company.

The will of the late Mr. Charles Tothill, a former superintendent of the Eastern Telegraph Co., left estate valued at £4,783 (£2,974 net personalty).

The friends in this country of Monsieur Mercy, of the Post Telegraph and Telephones of the French Republic, who are acquainted with Mr. Mercy's book on "*Le Système de Télégraphie Baudot et ses applications*," will join most heartily with the colleagues of his own nation in congratulating this well-known member of the Technical Committee (2^e Section Télégraphe) upon the honour recently conferred upon him by *la Société d'Encouragement pour l'Industrie Nationale*, which has presented him with their silver medal.

News of the third C.C.I.T. came to the present writer from Berne within 24 hours of the sitting of that international and hard-worked committee, while the kindly thoughts of those members of my own and other nations whose signatures are at the moment before me are very much appreciated and earnestly reciprocated.

Companies.—Anglo-American Telegraph Co., Ltd., states that quarterly dividends amounting to 3½% on ordinary, 6% on preference, and 1½% on deferred, together with £57,750 for income tax, absorbed £262,500, being rent paid by Western Union Telegraph Co. for the year. Balance, £65,625 available for payment of dividends to Mar. 31 last. Western Union Telegraph Co.—Report for quarter ended Mar. 31: gross revenues \$28,325,818, against \$33,617,769 for first quarter of preceding year. Direct Spanish Telegraph Co., Ltd., shows that after bringing £2,172 forward from 1929, and meeting all expenses, balance is £11,335. Ordinary dividend 6% paid, carried forward £2,459.

Countries.—AUSTRALIA.—Reuter's Canberra agency states that the new beam wireless service between Sydney, Australia, and

Port Moresby, Papua, has been officially opened by Mr. Murray, official secretary to Papua. The new plant replaces one which was installed at Port Moresby in 1913 and eliminates the land line to Townsville, Queensland, from which the service was previously conducted. CABLE TELEGRAPHY.—The same Canberran authority informs us that the Cabinet Sub-Committee, consisting of the Prime Minister, the Postmaster-General, and the Attorney-General, which has been putting the finishing touches to the agreement between Imperial and International Communications Ltd., and Amalgamated Wireless (Australia), Ltd., has decided that the Amalgamated Wireless Co. shall have control of the cable terminals in Australia.

AUSTRIA.—As a result of recent arrangements between the Austrian Radio Communication Co. and the Mackay Radio & Telegraph Co., a wireless telegraph service has lately been inaugurated between Vienna and New York. BRAZIL.—From Rio de Janeiro, through Reuter's agency, we learn that under the terms of an official decree, of April 20, regulating the conditions for the operation of Brazilian telegraph services, the concessions for internal telegraphs, at present enjoyed by companies which also own submarine cables, will not be renewed. BULGARIA.—The country's first transmitter, says *The Electrical Review*, has been opened in Sofia. Messrs. Philips inform them that the station is installed in a bank building, has a power of 1 kw., a wavelength of 319 metres, and uses the call "Rodno Radio."

CANADA.—The total number of wireless licences issued by the end of January was 493,176, which is 69,030 more than the number in use at the end of the twelve months period of the Canadian Government fiscal year, 1929-30, and averages one set for 20 persons in the Dominion. Later news received states that at the end of February the official registrations show a figure well over the half-million. To be exact, 505,758, or 81,612 more than at the same date last year. CZECHO-SLOVAKIA.—*World-Radio* records considerable increases in the number of listeners in this country of late, the rate of progress being in the region of 2,000 per week, the total number up to April well exceeding 300,000. The centres of the radio trade, it would appear, are Prague, Brno, Bratislava, and Liberec (Reichenberg), in their order of importance. FRANCE.—The Government has approved a scheme for the expenditure of £500,000 on the reorganisation of the national broadcasting system. In place of the 17-kw. 1,725-metre transmitter known as Radio-Paris, new plant has now been erected at Essarts-le-Roi, several miles outside the city. It has a power of 120 kw. and is awaiting the provision of land lines to link it with the Paris studio. GERMANY.—The number of receiving licences increased by 222,172 during the first quarter of the present year, an increase of 6.3%. The grand total of about 3,750,000 includes 134,131 free licences issued to the blind, to disabled soldiers, and to the unemployed! During the last three months of 1930 the convictions for using receiving sets without licences were 258. The total number of these pirates found guilty during 1930 was 944. *German-Poland settlement.*—Diplomatic representations made by the German Ambassador in Warsaw, says *World-Radio*, led to an arrangement between the two countries which the wireless authorities and government representatives on both sides pledged themselves as follows: "Both transmitting companies pledge themselves in future to the utmost consideration, so that their broadcasts will not infringe in any manner the spirit of co-operation and understanding incumbent upon broadcasting in the fulfilment of its duty within the domain of international rapprochement."

GREAT BRITAIN.—The London *Daily Telegraph*, of May 9 last, gave an interesting account of an experiment made by Mr. John Baird, who, from "an inconspicuous van," picked up in the street, in broad daylight, the open air scenes of the ordinary daily life of Covent Garden Market. It is claimed that this is the first apparatus to be able to televise an open-air scene by ordinary daylight. It is understood by the *Telegraph* that arrangements are in hand for the inclusion of open-air scenes in further programmes sent out by the Baird Television Company for broadcasting by the

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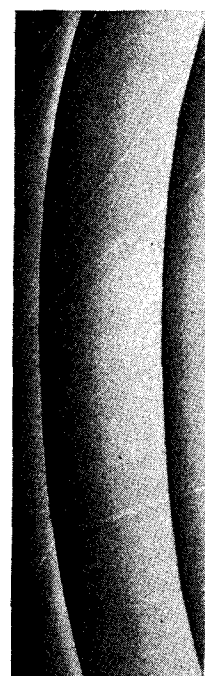
BRANCHES AND AGENCIES THROUGHOUT THE WORLD.

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THE achievements of the Strowger Staff in developing and perfecting dial telephone apparatus are many. Telephone men throughout the world are familiar with the most outstanding of these, such as the Type 24 Dial, the Monophone, the Strowger Director, the Plunger Type Self-Aligning Lineswitch, etc.

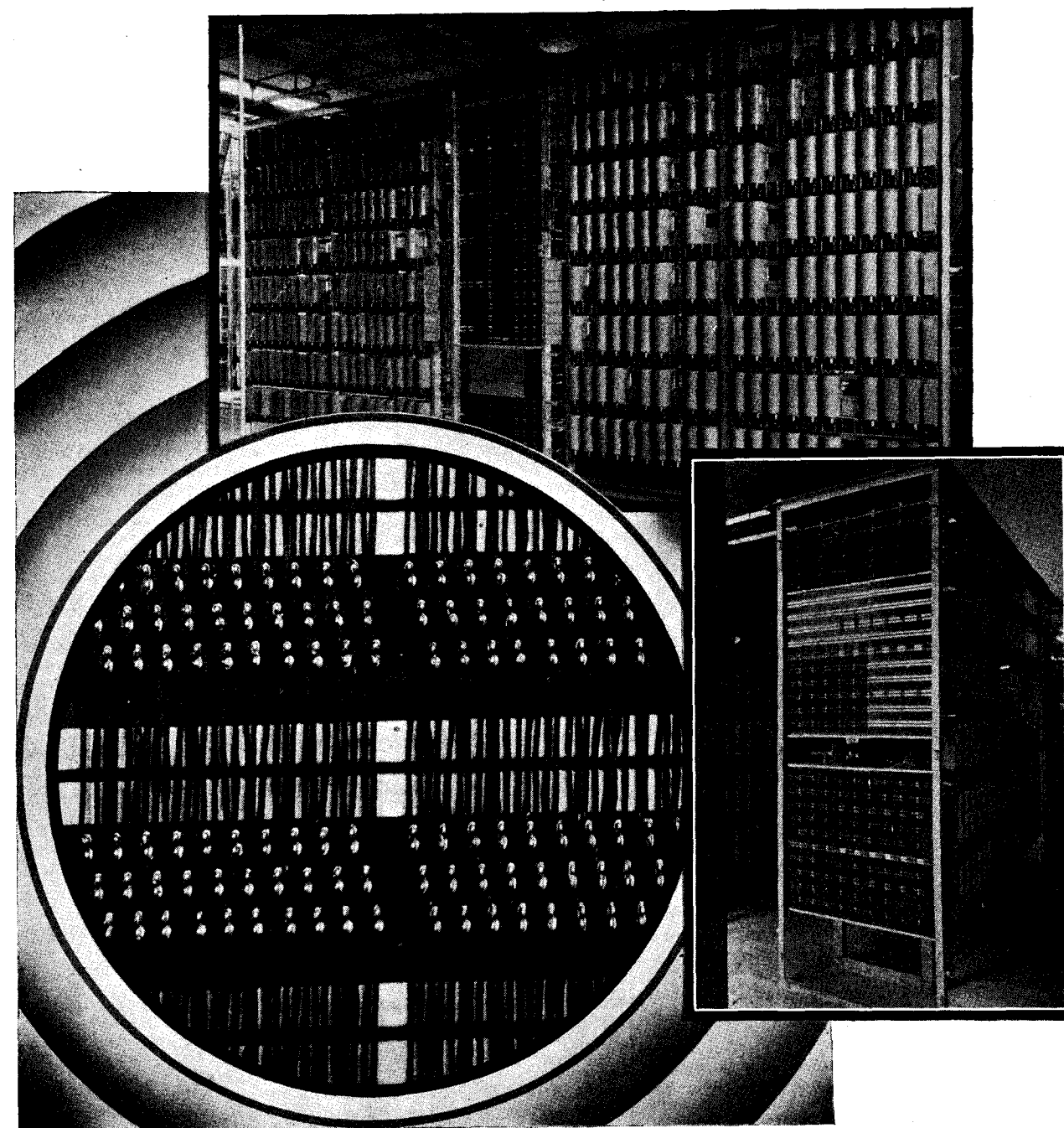
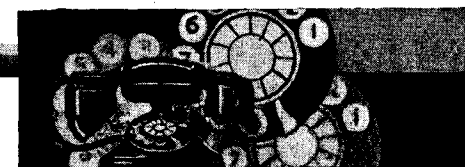
Equally important, however, but less well known, are the many refinements and perfections relating to the operation and maintenance of Strowger dial equipment—factors which are exclusive with Strowger apparatus and which have resulted from the experience which only forty years of designing and manufacturing dial equipment can give. A typical example of such a refinement is the selector distributing terminal assembly, shown in the accompanying views. This assembly makes easy the rearranging and regrouping of trunking equipment without disturbing cable runs and permits any desired form of multipling, straight or graded, to be simply applied.

Such refinements, common throughout the Strowger System, are not always obvious on first glance or to anyone unfamiliar with the operating aspects of dial equipment. But after such equipment is purchased and installed and in daily operation, such advantages in design and construction become increasingly important to the profitable operation of the property—and it is then, and then only, that the telephone executive realizes to the full the value of the name Strowger on his equipment.



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Ingenious Window Display in the show-case of Mr. A. W. Musto, Advertising Specialist, of 498 High Road, Leyton, drawing attention to the important part played by the telephone in advertising at the present day.

FOR OUR ADVERTISERS.

ALL enquiries should be addressed to the Department of Overseas Trade, 25, Old Queen Street, London, S.W., except where otherwise stated, quoting reference number in all cases. Supplies, &c., required by:—

Australia.—Melbourne, Posts and Telegraphs Department, June 9. Plug seat switches (A. 10876). **Uruguay.**—Montevideo, State Electricity Works, June 18. Supply of electrical accessories, including fuse wires, lever and rotary switches, cut-outs, plugs and sockets, &c., &c. (A.X. 10908). **Egypt.**—Cairo, Ministry of Interior, June 24. Overhead line material, tubular poles, 1,250 kilos of bare copper cable, 715 kilos bare copper wire. Also 320 insulators (A.X. 10891). **Chile.**—Santiago, Chilean State Supplies Department, June 30. Supply electric wire and other materials (C.X. 3550). **Australia.**—Melbourne, Posts and Telegraphs Department, July 7. Supply of about 20 accumulator batteries with various discharge capacities from 60 to 1,680 A.-h. (A.X. 10893).

Confidential memoranda on methods of trading and the appointment of agents in Egypt, Cuba, Uruguay, Guatemala and Paraguay, prepared by Consular officials, have been received in the Department of Overseas Trade and sent to firms whose names are entered on the latter's Special Register. *British firms can obtain copies of these from the Department as above by quoting the reference numbers C.X. 3,500, C.X. 3501, C.X. 3515, C.X. 3516 and C.X. 3525, respectively.* J. J. T.

PRESENTATION TO MR. F. BEAL, SOUTHAMPTON.

WHEN we assembled in the Accounts Office on Saturday, May 2, to say goodbye to Mr. Beal on his departure to take up his new post of Higher Clerical Officer at Guildford, we realised that we were parting not only with a valued colleague but with a friend and counsellor.

The District Manager, Mr. O. G. Lee, presided, and on behalf of the staff presented Mr. Beal with a gold watch, suitably engraved, as a tangible expression of the esteem with which he is held. Mr. Lee spoke in high terms of the good work done by our departing colleague, and extended to him sincere congratulations and best wishes for a happy stay in the Guildford district.

Mr. C. S. Weston, Staff Officer, briefly outlined Mr. Beal's career. He showed that Mr. Beal's promotion was an addition to the growing list of promotions from the clerical force at Southampton, and after telling a story which had little bearing on the ceremony in progress, Mr. Weston observed "may the good work continue." In conveying his best wishes Mr. Weston endorsed all that Mr. Lee had said regarding Mr. Beal's enthusiasm for his duties.

Messrs. D. Wallace, Contract Manager, and R. Williamson, Traffic Superintendent, eulogised Mr. Beal for the cheerful co-operation that he had always extended on questions which affected their respective sections, and added their congratulations.

Messrs. Freeman, Bayley, and Walker, also spoke and wished Mr. Beal "all the best."

It was no easy task to respond to the warmth of feeling that had been displayed and to acknowledge the tributes which had been paid him, but Mr. Beal successfully mastered the situation. He thanked us all for "the nice things which had been said and for the splendid token of esteem." At the same time he pointed out that if he had been able to afford any help or assistance in the past it was only the reflection of that spirit of co-operation and friendship which had characterised those with whom he had come into contact.

We rejoice to know that Mr. Beal has obtained that promotion which he so well deserves.

C. B. CLAY FOOTBALL CHALLENGE CUP.

THE final tie in the C.B. Clay Challenge Cup was played on the Nunhead Football Ground on Thursday, April 30, between teams representing the S.E. External Section and the City Internal Section of the London Engineering District.

A large crowd of spectators attended to see what proved to be one of the most keenly contested of games. The City Internal Section, who are the present holders, lost the toss, and notwithstanding the disadvantage of having to play up the slope with the sun in their eyes, had the better of the opening play. After 20 minutes, however, from a breakaway by Abethall, who finished with a beautiful centre, Willett converted and thus enabled the S.E. External Section to open the scoring. Shortly after a second goal was scored for the same team by Byford from a movement which was also initiated by Abethall, who throughout the game played with great skill and resource. These reverses aroused the City Internal Section to renewed efforts, which were deservedly rewarded when Cowell headed a fine goal from a centre by Gadd, and half-time arrived with the S.E. External Section leading by two goals to one. With the advantage of playing downhill the City team pressed very strongly after the change of ends, and Cowell headed a second goal to equalise the scores. Though great efforts were made by both sides to obtain the winning goal, the second half ended without further score, and thus extra time was necessary. A desperate struggle ensued, and the supporters of both teams did their utmost to cheer their respective sides to victory, but the change of ends again arrived without further score. In the final fifteen minutes the excitement was intense and both goals had many narrow escapes before Sinclair eventually scored for the S.E. External Section, who then ran out winners of what all present agreed was one of the best contested games ever witnessed in this competition.

Colonel C. B. Clay, the donor of the Cup, was unfortunately not able to be present owing to an attack of lumbago, and in his absence the presentation of the Cup, together with miniature cups to each member of the winning team, was made by Mr. E. Gomersall, Superintending Engineer of the London District, who congratulated both teams on the fine sporting exhibition they had given.

This Football Challenge Cup, which was first instituted in 1898 by Colonel Clay when Metropolitan Superintendent of the late National Telephone Company, is still open for competition to all teams representing the staff of any branch or section of the Post Office associated with the Telephone Service in London, including the following departments:—

- The Secretary's Office.
- The London Telephone Service.
- The Post Office Stores Department.
- The London Engineering District.
- The Office of the Engineer-in-Chief.

Entries for the competition are cordially invited and particulars can be obtained from the Hon. Secretary, Mr. C. J. Head (London Engineering District), Mr. A. E. Wild (London Telephone Service), or Mr. F. Woollard (Engineer-in-Chief's Office).

The proceeds of all matches are devoted entirely to charity, and the competition has been the means of raising over £200 during the past few years.

B.B.C., who have been co-operating, as is well known, for some time. *A Broadcasting Indicator*.—It is claimed by the proprietor of a Brighton broadcasting relay station that he has invented an electric indicator by means of which he is able to test the popularity or otherwise of the subjects broadcast by the B.B.C. This particular meter, it is alleged, has been tried out on the 1,200 subscribers of the Brighton re-diffusion station with the following results:—Vaudeville tops the bill; the Boat Race and Cup Final give maximum attendance, while technical talks and lectures lead to much switching off. We would hear more of this matter, but understand the B.B.C. may test the system. From the *Electrician* we learn that a microphone and loudspeaker have been installed at Fanum House, the London headquarters of the Automobile Association, by means of which the Secretary, Mr. Stenson Cooke is able to speak simultaneously to the whole headquarters staff, numbering over five hundred. Fortunately there is no device by means of which the five hundred would be able to simultaneously reply! ICELAND.—The new wireless station is situated five miles east of Reykjavik on a hill. It has 500-ft. masts, a power of 21 kw., and a wavelength of 1,200 metres. It opened in December last, and cost £35,000. At present there are little more than 3,000 subscribers (at 27s. per head per annum), although with a population of 100,000 it is hoped that a figure of 10,000 will at least be reached. The managing director is responsible to a state board of 5 members.

INDIA.—*The Electrical Review's* Indian correspondent reports that the number of broadcasting licences has risen from 6,400 to 7,700. The numbers of fixed stations and mobile stations licensed were 171 and 31 respectively. The corporation of Madras has been given permission to broadcast. No particulars are given with this last piece of news, so that the value of the concession cannot yet be assessed. *The Lahore Y.M.C.A. Broadcasting Station*.—Started under the auspices of the Y.M.C.A., the Radio Club of Lahore, last year, obtained a transmitting licence from the Government, and have been allocated a wavelength of 340 metres, power 100 watts. The Government Telephone Department has given considerable facilities with a view, no doubt, of assisting its members in the study of radio communication. Many, if not all, of this club have made their own receiving sets. *The Electrical Review* goes so far as to say that "The Y.M.C.A. broadcasting station is entirely home made," and that "its efficiency is indicated by the fact that favourable reports have been received from distances of 1,500 miles and from all parts of North India. *The Telegraph Merger*.—Reuter's agency reports from Bombay that it is understood that negotiations are nearing completion for the merging of interests in wireless and cable telegraph traffic in India. It is believed that the existing Indian Radio Telegraph Co. will increase its share capital for the purpose of securing entire control of Indian business. While it is understood that the majority of the directors at the India end will be Indians, Imperial & International Communications, Ltd., will have a substantial holding in the new company. A report on the Telegraph and Telephone working in India for last year forms very interesting reading." Baudot continues to be the principal multiplex telegraph system in use, while "teletype" working was introduced at Calcutta and Delhi, both simplex and duplex. It is noteworthy that very satisfactory telegraph communication was maintained with countries in the west throughout the year by the three routes, the Indo-European to London via Karachi and Persia (now discontinued), the Eastern Telegraph Cable Co.'s via Suez, and the Indian Radio Telegraph Co.'s beam wireless route. A specially interesting item in connexion with the telephone system was the installation of a single-channel carrier-current circuit on an existing telephone circuit between Delhi and Agra, in order to obtain an additional traffic channel without the erection of further wires. Speech was eminently satisfactory. IRISH FREE STATE.—In Dail Eireann, the Minister of Finance, Mr. Ernest Blythe, stated that they had taxes of two kinds on wireless reception. The duty on apparatus was estimated to bring in £35,000 this year, and as the inauguration of the high-power station at Athlone would so increase receipts that all the expenses of broadcasting could be met out of income, it appeared

reasonable to regard the cost of erecting and equipping the new station as a capital item to be defrayed by borrowed money. The expenditure on the Dublin and Cork stations showed a reduction of £1,200 over the previous year. Mr. Heffernon, in moving an estimate of £1,451,775 for the Posts and Telegraph Department, said that "the telegraph branch was now the only service working at a loss." The estimated deficit is £127,400—over £20,000 less than that of 1929-30.

ITALY.—The new Palermo transmitter on the island of Sicily, according to the latest advices, should be working by the time these lines are in our readers' hands. The station, says *The Electrical Review*, is using the same 3-kw. plant which was originally at Rome, and will eventually relay the Rome programme. Its wavelength is expected to be in the neighbourhood of 200 metres. RUSSIA.—It is reported that the Soviet propose to spend £100,000,000 on wireless broadcasting stations by 1932. In broad confirmation of this a statement has been issued by the United States Department of Commerce, that plans are being made to build 22 additional stations of 100,000 watts, in addition to 133 stations ranging in power from 1,000 to 100,000 watts; 45 new stations are actually planned, according to this report, and over 30 of these stations are expected to be installed by the end of the present year. From the same source it is learnt that 2,764,000 receiving sets are in use, of which over two million are in the rural districts, as against a total of only 400,000 in 1929. SCOTLAND.—The B.B.C. transmitter at Edinburgh, which has been situated at the University Buildings since 1924, has been transferred to new premises of the St. Cuthbert's Co-operative Association at Port Hamilton, where it will remain until it is replaced by the high-power Scottish regional station which is now under construction near Falkirk.

SOUTH AFRICA.—The South African Budget of March last has increased the Custom duties on wireless apparatus from 3 to 20% *ad valorem*, says *The Electrical Review*, but adds that this does not affect radio-telegraph and telephone apparatus employed in the public interest. During the nine months March to December, 1930—the latest figures available—the number of wireless subscribers throughout the entire Union increased by 6,270 to 25,121. There are at present only three main transmitters to serve the whole of this huge area, viz., Cape Town, Johannesburg, and Durban. The Pretoria station has been reopened, however, for relaying, and it is thought probable that Bloemfontein will be fitted with short-wave plant. It is evidently considered by the authorities that the increased duty is not likely to decrease the rate of new licenceholders.

U.S.A.—*The Telegraph and Telephone Age* reports that Radio Commissioner La Fount recommends that before television enters the commercial stage, reports should be taken to provide strict censorship. He is also reported to have said that the development from the experimental to the commercial stage should be held back until Congress and various States had provided means for its regulation. He feared that there might be abuses of television either through excess advertising or objectionable pictures, and provision should be made for its control!

The annual report of the Western Union Telegraph Company (incorporated in 1851) states, among other interesting items, that of its land-line telegraph business, comprising 217,458 miles of pole lines (1,911,257 miles of wire) and 2,842 miles of underground line, 90% approximately is now handled by automatic means and the installation of multiplex apparatus on the main lines. The company's revenue for 1930 was \$133,200,000. Each of the three "permalloy" submarine cables can transmit a total number of words equal to the combined capacities of the company's seven cables of older design.

Liberty.—"It is important to give the freest scope possible to uncustomary things, in order that it may in time appear which of these are fit to be converted into the customary."—JOHN STUART MILL. J. J. T.

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

VI.

DESCRIBE the manner in which connexion between two subscribers on the same 4-digit automatic exchange is effected.

A prize of a book will be awarded for the best answer, which should reach the Editor by June 30. The correct solution will appear in the August issue.

SOLUTION TO QUESTION IV.

The high standard of answers continues to be maintained. The answer submitted by Mr. A. G. Lyddall, 52, Bushey Park Road, Teddington, Middlesex, has been chosen as the best; it is given below.

"The main distribution frame is the first item of equipment within the exchange building; the whole of the external cables are terminated on the frame, being connected to the fuse or street side, where two fuses per circuit are provided.

"On the other side of the frame are mounted the heat coil and lightning protector units, each accommodating 20 circuits with two heat coils and lightning arrestors per circuit, which form the termination for the internal cables; by means of jumper wire, it is possible to connect any pair of wires on the street side to any pair of wires on the internal side.

"The heat coils, fuses, and lightning protectors together provide a safety device for the protection of the internal apparatus of each circuit against damage from contact with other current-carrying wires, or as a result of the line being struck by lightning.

"The most important facilities which the main frame offers are:—

- (i) Termination of the external cables.
- (ii) Termination of the internal cables from the exchange apparatus.
- (iii) Provision of a connecting point between the external and internal cables.
- (iv) Provision of a direct testing point to the external cables.
- (v) Provision of a testing point to the internal cables.
- (vi) Accommodation for protective apparatus.

"The less important facilities offered are:—

- (vii) Provision of a ready disconnecting point for rendering lines temporarily out of service (T.O.S.).
- (viii) Partial provision for observation service.

"In general, testing is carried out from the internal side of the frame by means of a horse-shoe testing clip which is inserted between the heat coil springs after the heat coils have been withdrawn.

"The intermediate distribution frame consists of two sides, the multiple side and the local or answering jack side. The multiple side comprises the cables from the switchboard multiple in numerical sequence and the cables from the internal side of the main frame also in numerical sequence; these two sides of cables are teed together on connexion strips. Thus, provision is made for traffic in one direction by this arrangement, i.e., calls outgoing to subscribers and via junctions to other exchanges, from the switchboard multiple.

"The local side of this frame is provided to cater for traffic in the reverse direction, i.e. incoming to the switchboard. Similar connexion strips to those on the multiple side are fitted, and these form a termination for the cables from the answering jacks, lamps, and calling equipments; the cables are arranged in the order in which the answering jacks are placed in the panels of the switchboard. A jumper field, between the two sides of the frame, allows for jumper wires to be run to connect any answering jack with any multiple number.

"The prime reason for the provision of an intermediate distribution frame is to provide a point in the exchange where the traffic load given to each operator may be equalised. For example, subscribers whose numbers range from 101 to 200 on the multiple side might originate a greater number of calls than another group of 100 subscribers, in numerical order. If the former group were jumpered in numerical order to 100 answering jacks on an operator's position, then the operator would be over-loaded by comparison with another operator; with two sets of cables on either side of the frame, a flexible arrangement of jumper wires between them is obtained, so permitting busy subscribers' lines to be intermixed with those of less busy subscribers, and a more equal distribution of traffic spread over the operators' positions results. A similar advantage is obtained for the termination of incoming junctions on the operators' position. The frame also forms a convenient point for the insertion of auxiliary apparatus in the incoming junction line circuits.

"The intermediate distribution frame also provides access to subscribers' lines for interception and observation purposes. In the former case, it is necessary to interpose apparatus between the multiple jack and the calling and answering equipment; with the flexibility afforded by the frame, this is a simple matter."

[Mr. Lyddall has selected Perren Maycock's "Electric Circuit Theory and Calculations" (Sir Isaac Pitman & Sons Ltd.) as his prize. Three out of four prizewinners so far have selected this book.]

HELPLESS.

In the *Telegraph and Telephone Journal* for September, 1928, there appeared an article by the present writer entitled "Help!" It was an appeal to the Staff outside the Contract Branch to emulate their fellows in America by bringing in orders for telephone service or giving in to the Contract Branch names of possible subscribers for new lines or extensions. Facilities were provided to enable this readily to be done. Cards were made available in all exchanges and in every section of the Office to make it easy for the staff to help, and certain of the Staff Associations drew the attention of their members to the advantages likely to accrue to themselves through a largely increasing service. In spite of all that has been done the results are miserably disappointing.

Of the gross new stations contracted for in London since the inauguration of the scheme in 1928, the proportion passed forward by the staff outside the Contract Branch is .000065. What this represents in stations you can work out for yourselves, for by this exercise you will probably appreciate the position more.

In local American telephone journals constant reference is made to the orders "turned in" by the Commercial, Traffic, and Engineering Staffs, and in the issue of *Telephone Talk*, a journal of the British Columbia Telephone Company for February, 1931, there is a detailed statement of such orders which shows that, on a system having apparently 117,748 stations at the end of February, 1931, for the four months ended February, 561 stations were obtained by this means. If the same ratio were applied to London, approximately 3,400 stations would have been obtained in the period of four months. Whereas But no doubt you have already worked out the figure for yourselves.

Let us for a moment consider the position to see if it is possible to arrive at the reason for such a lamentable state of affairs. We know, for instance, that the public in this country has never taken to the telephone service as the North American public has. Do the same fundamental causes outside territorial causes, higher taxation and the more complete transport and telegraphic facilities available in this country apply also to the lack of help—self-help—supplied by the staff?

Is it the climate or is it the innate conservatism of the British people or lack of educational advertising or the constant adverse criticism from which we suffer? Do British people work on more

leisurely lines so that they would rather spend time making a journey to see a friend or customer than talk to him on the telephone and have more time for something else? Are our housewives more energetic than those in America, so that they would rather run up and down stairs to answer the telephone call than have a simple extension fitted costing less than the price of a couple of cigarettes a day? Is it absence of enterprise which prevents our tradespeople fully appreciating the advantages of telephone orders? Why do they not do everything possible to encourage them and to see that the goods they supply in response to a telephone order are equal in quality to those which would be chosen by the housewife if she visited the premises personally? Why do they not advertise more for such orders? How many tradesmen have tried soliciting orders by telephone? If tactfully interviewed and carried out there is a big field to be exploited in this direction. On the other hand, I believe many people resent being canvassed for orders on the telephone, though why they should do so if the right methods are adopted by the tradesman is, I believe, just conservatism. A few 'slogans' such as:—

"Don't travel, telephone"

"Order your goods by telephone"

"Speak to your friends by telephone"

and so on, constantly hammered in, and a special effort by the Department to induce tradesmen to install a proper telephone order section might help to overcome this difficulty. Some of the large stores are quite up to date in this direction, but the smaller people lag behind. All these things have their effect and have prevented in this country the enormous development to be found in Canada and the U.S.A.

Might it not be a good idea to try the effect of a special canvassing staff devoted wholly to calling upon existing subscribers to point out how more use can be made of the Telephone Service and so endeavour to stimulate the flagging calling rate? Telephonists might prove useful in this connexion for calling at private houses and even at business premises where their knowledge of operating methods might be a valuable asset.

What bearing has all this on the orders obtained by the staff?

Much the same fundamental differences which apply to the public of this country and that of North America apply in some measure to the staffs.

Our climate lacks the crispness of North America and does not to the same extent engender that "must be up and doing" feeling. Our education of the staff, in common with our education of the public, has probably been lacking in certain essential features.

The "mud slinging" which we have to submit to may make the staff shy to proclaim themselves telephone men or women, in case they have to meet the unfair criticisms culled by the public from the so-called "popular" press.

Orders in this country are undoubtedly more difficult to obtain, and probably want of success or even a direct rebuff may have had a disheartening effect and prevented a second venture into the intricacies of canvassing for telephone service. On the other hand, as the staff is aware that the Contract Branch is prepared to take over the canvassing part of the transaction, there is not the same excuse for failing to send forward names of likely users of the service. So we must look elsewhere for at least part of the trouble.

I am sorry to say that in my view it is not wholly a lack of opportunity or knowledge but a lack of enthusiasm which is at the root of the difficulty.

Whose fault is it then, if fault there be, that there is not among the staff in this country that fervent white-hot enthusiasm which pervades the staffs of telephone companies in America? It is not as if the American companies paid a commission on the orders obtained. I am credibly informed that such is not the case. An acknowledgment of no great value, such as a fountain pen or a dinner to those who do best, is the most that can be expected.

Is it that as employees of a State-owned system there is no incentive to do more than the immediate task? The solution is not to be found in that, for even in the old National Company's

days inertia in this direction was noticeable. It can only be surmised that, like the rest of the British people, the staff as a whole is for one reason or another not yet "telephone minded."

How can this state of affairs be remedied? The answer, as I see it, is education and encouragement. The education of the public on telephone matters is being carried out to a greater extent than ever before, and will be intensified. Advertising matter in more attractive forms is being thrust before their eyes and into their letter-boxes. Kiosks which certainly attract attention to themselves are a constant reminder that telephone service is becoming a big part of the national life. Displays of telephone apparatus in shops and stores promote thoughts on telephone service. The substitution of automatic for manual exchanges has an advertising value.

The public is not being allowed to forget the service which it owns and should support. What about the staff? What has been done to educate them? Are they not so wrapped up in their own particular little section that the wider view of the service as a whole is lost to them? I suggested at the last Contract Managers' meeting that good would be done if headquarters published a periodical bulletin giving useful information, &c., culled from the press in this country and America for the use of the Contract Staff, and there is everything in favour of extending the scope of it to include items of interest regarding the past, present, and future of the British Telephone Service, and to widen the scope of its distribution to the whole staff including Engineering Staff. A few short, encouraging phrases to stimulate a livelier interest in the Service might be included. Something of the kind is being started in London and will provide for matters of local importance being brought to the notice of the staff each quarter.

Much more could be done by supervising officers both by precept and practice towards the education and encouragement of their staff, both on entry into the service and afterwards, to look beyond their immediate duty to the service as a whole. In other words, to lead them sufficiently far from the trees to enable them to see the wood. The staff will benefit through the wider outlook and, if I mistake not, be amazed at the ramifications of the business in which they are engaged, interest will be aroused which, if encouraged, will lead to enthusiasm, and the problem may thus be solved.

I say, if encouraged. I believe in encouragement, for it begets enthusiasm, whereas constant criticism has on certain people a humbling effect which produces an inferiority complex, nerve goes, and the individual fears to launch out in new directions in case he makes a mistake, enthusiasm is damped and ultimately dies, and the service suffers as well as the individual. No one really minds constructive criticism or even being hauled over the coals when it is deserved, but would not the staff appreciate and do better work for a word of encouragement for some task particularly well performed even if it forms part of their "duty." To be perfectly frank, I believe that the service takes too little account of the psychological effect of a judicious clap on the back for some difficult piece of work particularly well carried out. I do not for a single moment suggest slipping into a state of senseless or sloppy sentimentality, but there is a middle course. When I have propounded this theory it has been said to me that surely the staff do not require thanks for doing their duty. I think there are occasions, however, when a word of encouragement in season would send men and women home with a song of praise in their hearts and determined to merit the further approval of the "powers that be." Others who heard of it would endeavour on their part to catch the eye of their chiefs, and to obtain their approbation. The American telephone journals already referred to show that the authorities there appreciate the point, and it is possible that therein lies the reason for the remarkable enthusiasm which prevails among American telephone men and women.

I suggest, then, that consideration of this important subject should not be rejected as unworthy of our great Service, but that we should try what a campaign of education and encouragement will do to produce more enthusiasm and end what is an unsatisfactory and disappointing situation.

W. F. T.

REVIEW.

"Elementary Hyperbolics," for Technical and other Students.
By M. E. J. Gheury de Bray. Published by Crosby Lockwood & Son. Vol. I, xi + 351 pp. Vol. II, xii + 209 pp. Price 7s. 6d. per volume.

Three years ago we reviewed in these columns a book by Mr. Gheury de Bray entitled "Exponentials Made Easy." In this book the author showed how a branch of mathematics, usually considered abstruse, could be made not only understandable, but also extremely interesting, to the reader with even only a very elementary knowledge of the subject.

In the present book Mr. de Bray has continued his good work by dealing with the subject of imaginary qualities and hyperbolic functions in the same manner.

These functions are not only very interesting in themselves, once the fog in which, for the beginner, they are so often shrouded has been dispersed, but they are also of the very greatest importance to telegraph and telephone engineers. For example, the investigation of the theory of the propagation of electric impulses along lines would be extremely difficult without their use.

The subject is treated in the same interesting and readable style which marked the earlier book, and we can strongly recommend the present book to all who are in any way concerned with the problems of long-distance telegraphy and telephony.

C.T.O. NOTES.

Retirements.—Miss E. F. Duncan, Supervisor (Higher Grade) and Messrs. W. Bridger and H. G. Cook, telegraphists.

Obituary.—We much regret to record the passing of another old and popular ex-superintending official, late of TS, by the death of Mr. A. C. Paffard, in his 80th year. In his early years Mr. Paffard was an ardent athlete and a very active member of the "I" (Telegraph) Company of the old 49th Middlesex Rifle Volunteers. He entered the service at Southampton in 1870, and was appointed Second Class Assistant Superintendent in 1895, being promoted to First Class Assistant Superintendent in 1903. We tender to his two daughters the sincere sympathy of their late father's old friends.

We also regret to note the death of Mr. E. J. Melvin, a former Assistant Superintendent, in his 76th year. Indifferent health necessitated his premature retirement in 1913.

Centels Chess Club.—The Centels Chess Club brought their 1930-31 season to a close with a fine win over the H.Q. Ministry of Labour. The club finished second for the third consecutive year in Division III, Civil Service League.

The match records were as follow:—

	Played.	Won.	Lost.	Drew.
First Team ...	9	6	—	3
Second Team ...	11	3	6	2

The Centels Club still retains the record of never losing a game by default. This is the eighth season.

Messrs. Fennell and Garner tie for the President's Prize.

Cricket.—The first-round match in the Curtis-Bennett Shield Competition between the Centels and the Owls (Inland Section) ended undecidedly owing to the inclement weather, and the match has to be replayed. The scores were:—

Owls 129 for 7, declared. Bossett 3 for 26.
Centels 54 for 3.

ABERDEEN NOTES.

On the occasion of her transfer to the Controller's Office, Edinburgh, Miss A. D. Creighton, shorthand typist, was presented on April 18 with a gold wristlet watch by the staff of the District Manager's Office, Aberdeen.

Of a pleasant and obliging disposition, Miss Creighton was a favourite with all at Telephone House, Aberdeen, and carries their best wishes with her to the capital.

A man was sent from a farm in Aberdeenshire to telephone to the local vet, that his services would not now be required. The man went to the call office, entered the 'phone cabinet, looked round and shouted "Dinna come noo—the coo's deid." That done, he came out delighted and told the farmer it was easy to 'phone.

CORRESPONDENCE.

THE INVENTION OF THE TELEPHONE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—In your March, 1931, number, I read with much interest the article entitled "Long Distance Telephony in the U.S.A.," by W. C. Griffith. Mr. Griffith's statements in regard to the invention of the telephone do not, I think, give a true picture of the facts and have evidently been taken from American (U.S.A.) sources.

The following is an extract from a speech by Dr. Alexander Graham Bell, and admittedly his statements must be taken as final, which shows that the telephone is a British (Canadian) invention.

Extract from Dr. Alexander Graham Bell's Speech in Brantford, Ont., Canada, at Dedication of Monument, Oct. 25, 1917.

"There are some things worth living for," declared Dr. Bell, in addressing the gathering attending the ceremony, "and this is one of them. I came to Brantford in 1870 to die, having been given only six months to live. I am glad that I survived to witness the unveiling of this monument in Brantford.

"As I look back in time, I recall the Brantford of those days, The Grand River, my dream place on Tutela Heights where the vision came to my eyes. I never thought I would see such a memorial as that erected to myself here and to the invention itself. I cannot claim to be the inventor of the modern telephone—that is the product of many minds. I but initiated the transmission of sound. It was initiated here.

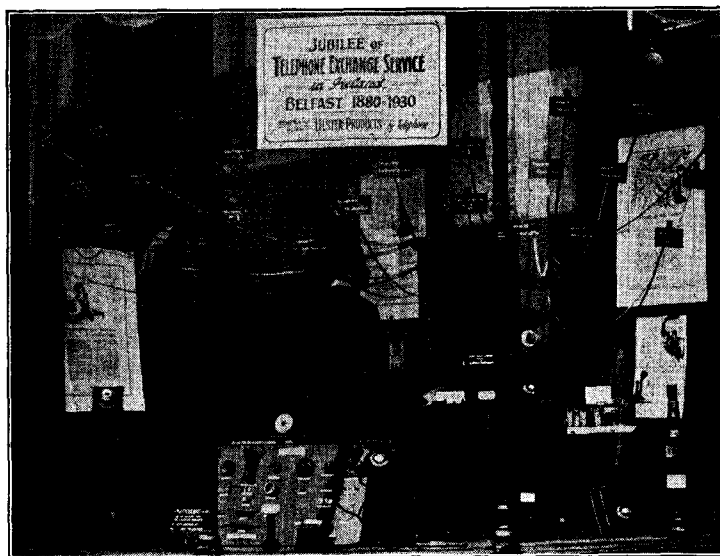
"Too little has been said in the United States about Brantford. I am prepared to state that Brantford is right in claiming the invention of the telephone here. Boston is right in claiming to have seen the first telephone. It was conceived in Brantford in 1874 and born in Boston in 1875.

"The first time that the instruments were miles apart and speech successfully transmitted was here in Brantford in August, 1876, between Brantford and Paris, Ont. You have two things you can justly claim—the invention and the first transmission of the human voice over a real wire."

It is a pity that we all accept the American version so readily and I am writing this trusting you will endeavour to make clear to your readers Dr. Bell's own viewpoint.—With best wishes, I am, very truly yours,

F. J. NISBET (Lieutenant-Colonel),
Exchange Manager,
New Brunswick Telephone Co., Ltd.

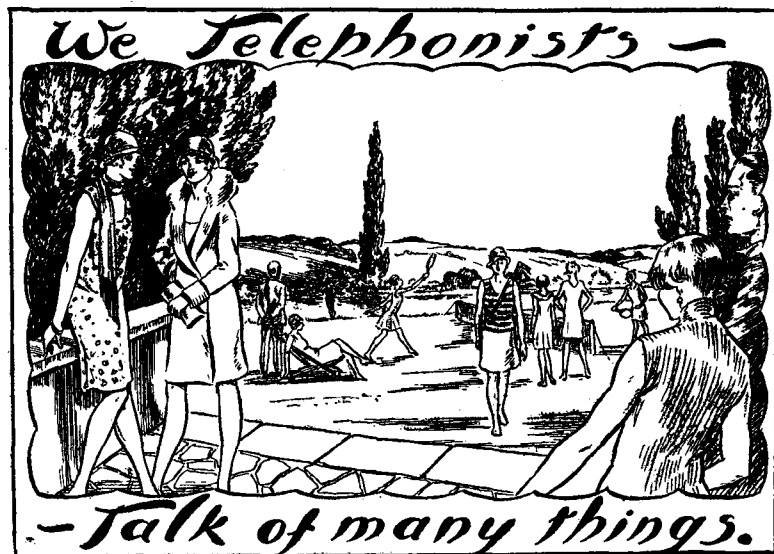
St. John, N.B., April 25.



WINDOW EXHIBITS.

A BELFAST correspondent writes: "In the April issue of the Journal (page 156) the window exhibit at Messrs. Selfridge's is referred to as a "definite innovation."

"In the circumstances, I am sending a photograph of a "Jubilee" window exhibit in one of the windows of Messrs. Robinson & Cleaver, Ltd., Belfast. It remained on exhibition from Jan. 25 to Feb. 8, 1930."



Therefore, Let Us Hike.

THE call of the footpath, of the open moor, of the rolling down, of the heathered hill; of the bouldered mountain, is upon us. The gurgle of the stream, the rush of the beck, the tinkle of the splash, the roar of the fall, the whisper of the bog, tease remembrance. Out there the birds are twittering, fluttering, chirping, hopping, singing, winging. Out there are the seething ant, the lurking spider, the drowsy bee, the flickering butterfly, the tell-tail rabbit, the trapezing squirrel, the scurrying beetle, the timorous mouse, the slithery snake. Out there are the stately iris, the gilding buttercup, the pert daisy, the dainty harebell, the chaste marguerite, the mocking garlic, the rusting sorrell, the adventuring pimpernel, and the gemming dew, the emollient rain, the woolly mist, the galleon cloud, the fragrant breeze, the beaming sun or the grey light of the low sky which intensifies the vivid colouring of the trees and grass. The cherry is full of snow, the chestnut is lighting her candles and the bluebell is ringing her inaudible changes.

These, and scores of other sights, sounds and scents, wake the memory and stir the desire. To each the appeal comes differently, as a definite call of the open or as an intangible, inexpressible, mystical yearning. Therefore, let us hike. Let us blush to own wheels: let us glory in our legs. Once we had none, now it is known that we have ankles—yea, even calves and knees. Let the pestiferous stinkadore hoot and chug its tyred way along the bubbling tarmac. Let the plus-foured with bags of sticks chase pills over the green like demented apothecaries. Let the portly bowl the biased bolus over the velvet. But let us hike with a stout sole, a rucksack and a one-inch map over the wavering path by "green pastures and still waters" to wherever there may be.

But we must hike, for to ramble is ineffective. Once your rambler was really a hiker, but the noble profession has become degraded. To-day the rambler, as likely as not, will wear a stiff collar, an attaché case, creased trousers and a hat. Or she will wear high-heeled lizards, fine silken stockings, flimsy georgette, a large hat and gloves. Together they will hug—the highway—and if they venture off it will be into a field to play with a ball. Oh, gosh! And his boots will shine brightly with polish. Polish! Pah! The main purpose of Nature in inventing castor oil was that hiking boots should be anointed therewith, but some interfering chemist perverted its use. The rambler will talk of the six miles he has walked and then ask for a needle for his blisters. The hiker doesn't count miles—he may boast of the number of peaks he has bagged in one day—and he never has blisters.

* * *

The thrush has finished Evensong, the crimson fades from earth and sky, the moon silvers and soars smaller and smaller. Enfolding Night has touched the earth with peace and the stars keep watch with the owl. The rambler waits with what patience he has for a train to "a goosefeather bed, with the sheet turned down so bravely, O." The hiker turns to "bracken for a wink on Mother Knee" or to tent, inn or Yo-Ho. And so to bed, mighty pleased—but no one knows what the hiker dreams.

And when the hiker departs for the last great hike, let them drop his clay in the bog on the loved hillside, let the trees nod as he passes, let the boulder be his headstone, let the frost carve his epithet and the moss keep it green, let the heather be his wreath, let the wind and the stream sound his requiem and the birds sing his vesper.

"Breathless, we flung us on the windy hill,
Laughed in the sun, and kissed the lovely grasses."

PERCY FLAGE.

A Reply.

TO THE EDITRESS.

As an ardent motorist, I cannot allow Mr. Percy Flage's article to pass without protest. When he talks about the pert daisy, the mocking garlic, and so on, it shows how little imagination the man has. If he will reflect for one moment he will see, instead of these impudent weeds, a stately petrol pumping station rearing it proud head, and those of its various shapely pumps, above the landscape. He will see arterial roads—miles and miles of them. He will see telephone boxes at every corner. Let us have more of these magnificent edifices, let us have more and more arterial roads, more and more telephone boxes—and the ant will soon cease to seethe, the spider to lurk, and the snake to slither. And as for his "emollient rain" and "woolly mist," what true motorist has not cursed long and loud when these evils, together or singly, have befallen him? "Blush to own wheels," indeed! Mr. Flage should blush to own such antiquated views on Nature in this glorious age of jazz bands, broadcasting, gramophones (with pick-up), talkies, and all the other mechanical aids to a decent modern existence.

He talks, too, of the "degradation of wearing gloves." Another writer has voiced the same subversive views in the following rhyme:—

"Why do you walk through the fields in gloves,
Missing so much and so much,
O, fat white woman, whom nobody loves,
Why do you walk through the fields in gloves,
While the grass is as soft as the breast of doves,
And shivering sweet to the touch.
Why do you walk through the fields in gloves,
Missing so much and so much?"

I can answer this question at once, because the lady in question happens to be my wife. She wears gloves, let me tell Miss Cornford and Mr. Flage, for cleaning the jets, filling up with oil, changing the wheels, tinkering with the engine, and what not.

The call of the road is upon us. The gurgle of the petrol, the rush of the water into the radiator, the tinkle of the oil-can, the roar as she touches 70, the whisper of speed-cops as they are left far, far behind, tease remembrance. Out there the birds are twittering, drat them, and Nature goes about her ghastly business. But within the languorous saloon (motor) no birds sing, no breath of air stirs the fragrant atmosphere, heavy with the subtle aroma of petrol and the exhaust pipe. Out there, the footsore hiker, the crawling pedestrian! Out there the prehistoric horse, creeping with leaden feet over a disgusted earth, as the road unfolds its white ribbon to make a path for the speed kings. Out there the suicidal cat, the death-deserving dog.

Madam, when the hiker departs for the last great hike, I for one shall not seek to detain him. Let him depart, and all his kind. We motorists, of whom it has fittingly been said "Earth has not anything to show more fair," complete with every gadget devised by the ingenuity of man, will go from strength to strength:—

"In topmost gear climb every windy hill,
Shut out the sun, root up the plants and grasses."

INDIGNANT MOTORIST.

May!
Stay—
This is no day
When lambs will play.
I say
O cursed May
Your horrid way,
And vile display,
Brings sheer and most complete dismay.
This May
Who could be gay,
Though drawing ten times normal pay,
There isn't even one small ray
Of joy in such a May.
Its skies are grey,
It has no day,
Just nights-outré,
Nothing O.K.
I feel a Jay
But say,
May,
Don't stay!
My nerves you fray.
Go, go away.
She's gone, Hurray!

"FRANCISCO."

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLASGOW TELEPHONE NOTES.

We are happy this month in being able to mention one who, for many years, has shown an active interest in the *T. and T. Journal*. Miss Tulloch has frequently favoured us with contributions to this column, chiefly, it will be remembered, in the form of poetry. Her ability in this respect may be accounted for by the fact that she hails from Edinburgh where, according to a Glasgow authority, folks have leisure to develop an interest in art.



MISS TULLOCH.

In 1901 Miss Tulloch came over to help us, and since then, as a Telephonist and Supervisor, she has proved herself an able member of the Glasgow staff.

A few weeks ago she took up the duties of Travelling Supervisor in place of Mrs. Reid, who has retired on pension. As we know, the duties differ considerably from those of an Assistant Supervisor in a large Exchange, but Miss Tulloch should find as little difficulty in undertaking these as she will find in extending to her staff that sympathetic helpfulness they enjoyed for such a long time under her predecessor.

Statement made to an H.C.O. during interview with Subscriber.—"I am quite sure I had not these calls previously, you were charging me on your account for listening in, on the wireless, and I had to stop it."

Amazing.—It has always amazed us, watching moving pictures, that everybody using the telephone gets the right number every time, and without having to consult a directory, either.—*Hamilton Spectator.*

Happy Japan.—The Japanese have no swear words. Thus we know they never get out of a bath tub to hear an apologetic voice say: "Wrong number."—*Guelph Mercury.*

Balmore.—At a meeting of the telephone subscribers in Balmore, near Milngavie, on May 9, Miss Tinto, who has been in charge of the telephone exchange in the village for many years, was presented with a handbag and purse of Treasury notes as a mark of respect and appreciation. Owing to a rural automatic exchange having been installed at Balmore, the manual exchange has been dispensed with.

Marriages.—Miss J. Livingstone, Rutherglen Exchange; Miss J. I. D. Hardie, Trunk Exchange; Miss A. Macleod, Bell Exchange.

On Complaints.

"Speak your griefs softly."—(*Julius Caesar.*)

"It ain't no use to grumble and complain;
It's jest as cheap and easy to rejoice;
When God sorts out the weather and sends rain,
W'y rain's my choice."

(*J. W. Riley.*)

"To the President of the Western Union in New York: Dear Sir, I desire to make a complaint, and I bring it to you, the head of the company, because, by experience, I know better than to carry it to a subordinate. Six days ago my daughter telegraphed me to meet her with a cloak at Portsmouth. Her telegram reached me just 15 minutes too late for me to catch my train and meet her. I judge that the telegram travelled about 200 miles. It is

the best telegraphic work I have seen since I have been here, and I am mentioning it in this place not as a complaint but as a compliment. I think a compliment ought always to precede a complaint, where one is possible, because it softens resentment and insures for the complaint a courteous and gentle reception."—(*Mark Twain.*)

Extract:—"I do not wish this letter of mine to be regarded as a complaint, but I would just like to let you know my experience on the 'phone about 10 o'clock last night." (Here followed the experience.) "I hope, Sir, that you will understand that I seek to make these enquiries in a friendly and respectful manner, and that I have no wish to be offensive or unreasonable."

"Never descend to complaint."—(*D. B. Wyndham Lewis.*)

"I am obliged to Alexander the Platonist for the hint, 'not often, nor ever, without a necessity, to complain, either in my letters or in the common intercourse with my friends.' Catullus admonished me not to slight the complaints of a friend, even though they should prove to be without foundation, but endeavour to soothe and restore him to a right sense of my regard for him."—(*Aurelius.*)

"Never display a wound—except to a physician The sympathy of your friends will be in inverse ratio to the number of your grievances. You may have one grievance, but two are dangerous, and three make you absurd. If three people do you an injury, it is advisable to forgive two of them."—(*Bagshot.*)

"What I want boots not to complain."—(*K. Richard II.*)

"Complaints or prayers or convulsions will not change our destiny."—(*Clemenceau.*)

"To complain or not complain alike is unavail."—(*Aeschylus.*)

"I know nothing so useless, so utterly feeble and contemptible as the groaning forth one's helpless lamentations into the ears of our friends."—(*Scott.*)

"There are as many grumblers in the world as there are men."—(*Satanti.*)

"If that man has annoyed you, and if you would like to make a complaint, we will have him ejected." . . . "Why, no, I don't see my way clear to make a complaint. But I would like to place myself on record as asserting that I do not care for his company."—(*O. Henry.*)

"Henceforth I whimper no more, postpone no more, need nothing. Done with indoor complaints, libraries, querulous criticisms. Strong and content I travel the open road."—(*Whitman.*)

"Our aim is to convince subscribers and other members of the public who make requests or complaint, that they have the Post Office at their beck and call and that they can rely with confidence on the Department in every possible way."—(*P.O. Circular.*)

LIVERPOOL DISTRICT NOTES.

LIVERPOOL congratulates Mr. J. Hawitt, who has been appointed to the Head Postmastership of Malton.

Mr. Hawitt is a deservedly popular member of the staff, not only in his own particular branch but with all with whom he comes in contact officially and otherwise. Of pleasing personality, he puts the same zeal into his social and recreative activities as into his official duties. Possessed of a tenor voice of quality, he sings a good song and equally plays a good game of golf. While these gifts may not be indispensable in the post to which he has been promoted, there is no doubt they help to oil the wheels of the official machine when they are used as Mr. Hawitt uses them. May he be very successful and happy in his new environment and progress to further honours as time goes on.

We are pleased to record the promotion of Miss M. G. Roberts to the position of Assistant Supervisor, Class II, at Anfield Exchange, and to offer her our hearty congratulations.

Mr. W. Edwards, of the Liverpool Traffic Office, has left us finally to go to Bristol. It is not many weeks since he returned from Birmingham, where he had been for some months assisting with the work of transfer to automatics in that city. As a farewell to one who has earned the golden opinions of his colleagues and official chiefs, Mr. Edwards was the guest of honour at a high tea arranged by members of the Traffic Staff. The District Manager, Mr. W. E. Gauntlett, presented Mr. Edwards with a portable gramophone as a token of remembrance from his fellow members in the Traffic Department. Mr. Gauntlett referred to Mr. Edwards' excellent qualities and wished him every success in the future. Mr. Edwards replied and returned thanks in a characteristic speech.



J. HAWITT.

The staffs at Birkenhead and Rock Ferry Exchanges, with which Mr. Edwards has been closely associated, presented him with a tobacco pipe and the wherewithal to charge and light it.

At the opening meet of the Golfing Society, Mr. J. Liderth returned the best card with a net score of 74. The best gross score, 81, was returned by Mr. J. B. Millward. This was a stroke competition and also the first round of the Eclectic Competition. Although the weather was particularly inclement our President and Postmaster-Surveyor, Lt.-Col F. H. Kempe, M.C., made a point of being present.

An enjoyable evening was spent on the Bidston links when the first of the season's mixed foursomes were played off. There was a good muster, including Lt.-Col. Kempe, Mr. Gauntlett, Mr. Haygarth and our late colleague, Mr. Fred Beer, Captain of the Post Office Golf Club. The weather was exceptional and the partners of the gentler sex assisted in putting up some very creditable performances. The honours were carried off by Mr. A. Davies and Miss M. Vickers, of the Traffic Office and the Central Exchange respectively, with a net score of 76½.

NORTH WESTERN DISTRICT NOTES.

Wigan.

An illustrated lecture was given by the District Manager (Mr. J. K. Murray) and the Traffic Superintendent (Mr. R. Morgan) on Monday, April 27, to a representative gathering of the Wigan Chamber of Trade. The lecturers dealt comprehensively with the automatic system of working, shortly to be introduced in Wigan, and also covered much ground of an historical character.

Our sympathies are extended to Miss Rigby (Supervisor, Wigan) on the death of her father, which took place on May 6.

Blackburn.

An enjoyable evening was spent in the Belper Street Co-operative Rooms on April 9 by members of the Post Office staff and their friends, who gathered there for a social evening and whist drive, organised in aid of the Blackburn Royal Infirmary. A sum of approximately £6 was raised for that good cause.

About 150 people were present including Mr. Harvey (Head Postmaster) and Mrs. Harvey, Mr. Scott (Superintendent) and Mrs. Scott, and many colleagues from neighbouring offices.

After the prizes were awarded, dancing took place and everybody spent a very happy time.

The arrangements were admirably carried out by Mr. Hilton, who acted as M.C. and was assisted by capable stewards.

Preston.

Mr. C. Coward, Chief Inspector, Preston.—We regret to announce the death of Mr. Cornelius Coward which occurred on May 8. His was a familiar figure in the North-Western District. His service dates from 1887 when he started as a messenger. He passed quickly through the lower grades, was appointed Inspector in 1909 and Chief Inspector in 1919. He took part in maintenance of telegrams when the Preston Post Office was in Fishergate. He also assisted in the installation of the Manchester Trunk Exchange. He later was actively engaged in large underground works and endeared himself to all his colleagues on both the Engineering and Traffic staffs by his unflinching courtesy and helpfulness. Our heartfelt sympathy is offered to his wife and family in their sad bereavement.

Preston Transfer.—Now that the transfer is over we are able to sit up, take stock, and also appreciate the lighter side of the business. One of our Service Inspectors was seen wearing a worried look, and upon enquiry it was found that he had received instructions (in writing) from a member of the Traffic staff concerning an instructional visit. This was as follows: "Please call at (a certain subscriber's) and demonstrate the operation of the switchboard. It might be advisable to take one each of the various types of switchboard, as I am not exactly sure of the pattern of board fitted." The Service Inspector's remarks made the Traffic Officer "Sit up and take notice" instead of *vice versa*. (Sorry.)

Here is one from the Preston Exchange:—

IRATE SUBSCRIBER: "Ye'd have done better to leave this 'ere telephone as it was. How can I get 5562 with only one 5 on the thing?"

Now one from a temporary Demonstration Officer:—

"I have to report that my ringing tone, 4910, is engaged and does not produce the ringing tone, but the 'N.U.' tone."

Not from Preston, but culled from Yorkshire:—

"Ah want—one—nothing, nought, nowt—please, miss?" The operator gasped, and then provided the subscriber with number 1000, feeling a glow of satisfaction on finding that she had got the right solution.

Tell the World: Extracts from Subscribers' Letters.

Lancaster Exchange.—"I wish to express my appreciation of the trouble and courtesy that your exchange girls extended to me in telephoning yesterday morning to get an individual at Lancaster," &c.

Wetheral Exchange.—"I would like to take this opportunity of expressing my appreciation of the service rendered by the Wetheral Exchange. I have never had so much efficiency, civility, attention, and keenness to ensure a good service from any exchange, and before coming here, I was on the telephone in various places practically continuously since 1911, in the days of the National Telephone Company.

WESTERN DISTRICT NOTES.

Staff Appointments and Transfers.

Accounts Section.—We are pleased to record the promotion of Mr. G. S. Annear, in his own district, from Clerical Officer to Higher Clerical Officer. Mr. Annear will take charge of the Call Office, Staff and Wages Section.

We also welcome Mr. R. B. Fazackerley, Clerical Officer, from "Proud Preston" to "Glorious Devon."

Contract Section.—Mr. F. Hornsby, Contract Officer, Class II (Development), has been promoted to Contract Officer, Class I. Mr. L. W. Campion, Contract Officer, Class II, has been transferred from Torquay to fill the vacancy created by Mr. Hornsby's promotion and Mr. V. C. L. Holland, Contract Officer, Class II, Birmingham, has been transferred to Torquay vice Mr. Campion.

A Contract Officer's motto: "The problem of selling is to make people more interested in the goods than the price."

On Saturday, May 2, a Travelling Supervisor received a call from a rural exchange at a sub-post office asking for guidance in connexion with a small matter. The conversation ended with the Sub-Postmistress saying "Excuse me, Miss —, but do you happen to be planning to visit me next week?" The Travelling Supervisor replied "No, but are you experiencing any difficulty in which I could help you if I came?" "Oh, no," came the reply, "Only I would rather you did not come as we are going to do the whitewashing next week."

Note.—The Exchange switchboard is installed in the kitchen.

"There is no hair so small but hath its shadow."

Similarly, little errors in operating leave their effect on the telephone service.

A Link with the Past.

There are probably comparatively few officers in the service who are aware of the origin of the "Riding work reports," not excluding many Head Postmasters who keep such reports.

These reports originated in the days when Post Office Surveyors were actually surveying the roads with a view to establishing posts, going about their duties on horseback.

One day in 1862 a schoolboy was in the village tuck-shop in Harlow, between Cambridge and London, when a gentleman rode up on horseback, dismounted, and tethered his horse to a ring in the wall provided for the purpose. The tuck-shop was also the Post Office. After the gentleman had completed his business and departed, the Postmaster asked the boy if he knew who that was, and on the boy saying that he did not know, the Postmaster informed him that "that was Anthony Trollope, the novelist and Surveyor of the General Post Office." The boy was Henry Jenner, now M.A., F.S.A., Lecturer in Celtic studies at the University College, Exeter, and Librarian of the British Museum. Mr. Jenner (now a vigorous and delightful old gentleman of 83) journeyed, at 3 years of age, with his parents from St. Columb, in Cornwall, to Exeter to catch the train to London. The journey from St. Columb to Exeter was accomplished mainly by sea, as transport was somewhat difficult in those days in the West, and Exeter was the nearest railway station from which the journey could be completed to London. That was in 1851. Whatever else Anthony Trollope inspected at Harlow Post Office in 1862, he certainly saw no telephones or public call offices there, for a further 14 years had then to elapse before the invention of the telephone.

"There is a remedy for everything could we but hit upon it."

Rural automatic exchanges seem to have provided the remedy for troubles in respect of night and Sunday services in the villages.

F. J. F.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business transacted by the Contract Branch during the month of April resulted in a net gain of 3,421 stations, as compared with 3,382 stations in the corresponding month of last year.

Advertising.—A display of telephone apparatus and facilities has been arranged with Messrs. Benthalls' Departmental Store, Kingston-on-Thames, for a fortnight commencing June 1.

Similar arrangements are being made at the Agricultural Hall in connexion with the Islington Civic Week Industrial Exhibition, which opens on June 8 for a week. There will also be a display in the windows of the City District Contract Office, St. Bride Street, E.C.

These demonstrations depict in a variety of ways the growth in the use of the telephone. The many facilities offered are displayed in an attractive form, and the growing world-wide appeal of the telephone is a particular feature.

The neat and attractive paper imitation of a telephone kiosk which is circulating to the public inspired a reverend gentleman in a London suburb to take for his text recently "A Model Telephone Kiosk."

It is said that the vivid red "model" occupied a prominent position in the pulpit, and in the sermon the spiritual needs of the congregation were likened to the material advantages of the telephone, particularly in the home.

L.T.S. Sports Association.

Swimming Section.—The annual general meeting was held in the Conference Room, G.P.O. South, on Thursday, May 14. After the business had been disposed of Mr. Hugh Williams, in proposing a vote of thanks to the Chairman, Mr. E. A. Pounds, referred to his impending retirement from the Service. His long association with this section of sport, which he founded 11 years ago by establishing one club, and which now numbers about 33 clubs, embracing some 1,300 members, would never be forgotten. Mr. Williams read a letter from the Secretary, Miss Temme, who was too ill to attend the meeting, in which she expressed regret at her absence and requested that special reference should be made to the manner in which Mr. Pounds had assisted in the organising and development of the Swimming Section.

Mr. Pounds, in replying, pleaded guilty to initiating the movement, but claimed that the subsequent progress was entirely due to the energy of the respective clubs and their secretaries. He added that while his withdrawal from the Service necessitated his relinquishing the chair, his interest would be unabated and he hoped to be present at many of the swimming galas during the forthcoming season.

Athletic Section.—The arrangements for the annual sports are now almost completed.

The date, as previously announced, is Thursday, June 4, and the meeting will be held at C.S. Ground, Chiswick, at 5 p.m. prompt. An excellent programme has been prepared, including some very interesting athletic events and a push-ball match. It is hoped that a band will be in attendance. Miss Moyra Napier (daughter of the Controller) will distribute the prizes. Dancing in the pavilion will follow.

Now roll up members of the L.T.S., bring your friends and support Mr. G. W. R. Robinson (T/TKL), who has worked so hard to endeavour to make this annual event a success.

Tennis Section.—The summer tournaments are now in progress. The first round for the "Agnes Cox" Cup (Ladies' Doubles) is nearing completion, and that in respect of the "Pink" Cup has been finished.

The Association have entered for the Civil Service Lawn Tennis Tournament again this year. In the first round of the men's doubles we lost to the Air Ministry 1—6. The ladies, however, met with greater success by beating the Ministry of Transport in the first round of their doubles by 7—0. Their opponents in the next round will be Inland Revenue. The mixed doubles team also won their match against the Ministry of Transport, the score being 7—1, and in the second round they will play the Ministry of Pensions.

Football Section.—The last league match of the season was played at Raynes Park on Thursday, April 23, against the Ministry of Labour.

As the L.T.S. have already won the league championship for the season, it might have been expected that the match would be a tame affair; on the contrary, it was strenuously contested.

The result, a win for L.T.S. by 3 goals to *nil*, was a fine winding up to a successful season.

Casey (two) and Futerman (one) were the scorers. Dave Futerman, the captain, is to be congratulated on his fine play and generalship throughout the season. Much of the team's success must be attributed to his leadership, in addition to his football ability. A fitting consummation to the season

was the players' recognition of the great work put in by Mr. T. Culley, the secretarial genius of the club. After the match he was presented by the captain with a wallet, suitably inscribed. Appreciation of this kind was almost too much for the genial Tom, whose burly figure is so much in evidence during the winter "shouldering" human burdens and administering wonderful restoratives hidden away in his little bag.

London Phononists' Society.

The Telephone Play.—Requests from those who had been unable to attend the performances of Miss McMillan's latest production, "Say it with Music," given on April 9 and 10, were so numerous that it was decided to give a repeat performance on May 15. The members of the cast, and our producer, Mr. Pounds, responded enthusiastically to the popular demand, and as a result King George's Hall was again filled with an audience which was kept in a state of continuous enjoyment throughout the evening. One noted with regret, in the cabaret scene, the absence of Miss Blair-Street, whose splendid singing has always been such a feature of the annual Telephone Play and whose place it will be most difficult—if not impossible—to fill. We trust that circumstances will permit her to take her usual place in next year's play.

Where all achieved such success it would be invidious to select any for special mention; but every item, whether appealing from its humour or from its artistic beauty, was received with great enthusiasm and insistent calls for encores were frequent and were generously complied with. Our best thanks are due to our author, our producer and our cast for affording us another most enjoyable and memorable evening.

In the review of the Telephone Play appearing in the May issue of the Journal, no reference was made to a very interesting ceremony which took place at the close of the second performance of the play, by reason of the fact that our reviewer was present on the first evening only. It is generally known that for the past seven years Mr. Pounds has very kindly and willingly accepted the responsibility for producing the Telephone Play, and in view of the fact that his retirement takes place this year, the Society felt that the opportunity should be taken of recognising Mr. Pounds' services. Accordingly, at the close of the performance given on April 10 last, the President, Mr. F. B. Nichols, in a happy speech in the course of which he referred to Mr. Pounds' invaluable assistance in this direction, asked him to accept a grandmother's clock as a token of the society's appreciation. Mr. Pounds, who was received with great acclaim, both by the audience and members of the cast, suitably responded.

Victoria Exchange Dramatic Society.

On Friday, May 18, the members of the above Society gave a performance of one-act plays at the City Literary Institute, Drury Lane, under the direction of Miss Gladys Ellam.

The programme opened with "St. Valentine's Day," by Margaret Drew; the characters were:—

Clarissa	...	...	Beatrice Clarke.
Phoebe	...	...	Agnes Fairey.

The second play was the card party scene from Mrs. Gaskell's "Crawford"; the characters were:—

Miss Betty Barber	...	...	Dorothy Clark.
" Matilda Jenkyns	...	...	Constance Jago.
" Pole	...	...	Winifred Pointer.
The Hon. Mrs. Jamieson	...	...	Constance Loader.
Mrs. Forrester	...	...	Dorothy Hicks.
Peggy	...	...	Lillian Fowler.

The last play was "At Mrs. Beams," by C. K. Munro. The cast included:—

Miss Shoe	...	Holly Diment.
Mr. Durrows	...	Constance Loader.
Miss Cheezele	...	Agnes Fairey.
Mrs. Bebb	...	Ivy Bartrum.
James Bebb	...	Phyllis Rickwood.
Mrs. Stone	...	Bessie Anscumb.
Miss Newman	...	Beryl Underhill.
Mrs. Beam	A boarding-house keeper	Ada Wells.
Mr. Dermott	Temporary boarders	Mr. R. Hurdall.
Lama Pasquale	at Mrs. Beams'.	Ethel Cain.

During the intervals the orchestra attached to the Putney Literary Institute entertained us with popular music.

Space does not permit of mentioning the merits of each individual artiste—all contributed to a very fine performance—and it was evident, from the enthusiastic applause, that the audience had spent a most enjoyable evening.

Miss Buckwell, after being presented with a beautiful bouquet of tulips and iris, said, in a short speech, that the excellent production was due to the splendid training and encouragement given by Miss Ellam, together with the hard work and loyal support of each member of the Society. It required real enthusiasm to bring about such a very fine result. She called for three cheers for Miss Ellam, who was then presented with a bouquet from her pupils. The singing of the National Anthem concluded the evening.

London Night Telephonists' Luncheon and Smoking Concert.

Over 70 night telephonists of London held a very enjoyable luncheon and smoking concert at Anderton's Hotel, Fleet Street, on Monday, April 20.

Mr. W. J. Campbell (Foreign Trunks) was Chairman, and the guests were Mr. W. H. U. Napier, C.B.E. (Controller of the London Telephone Service), Mr. J. Hinshelwood, Mr. W. F. Dobson and Mr. H. Camp.

Mr. Campbell proposed the toast "Mr. Napier, Controller of the London Telephone Service." In a witty speech he referred to the exploits of Mr. Napier's ancestors, and their connexion with the Clan McFarlane, whose home lay on the western shores of Loch Lomond, near Loch Sloy, and who gained notoriety by their continual raids into the Lowlands, even penetrating as far south as England. In turning to Mr. Napier, Mr. Campbell jestingly suggested that the Controller had been faithful to the tradition of his forbears. He had not only come as far south on his journey of plundering, but had succeeded in capturing, in the shape of plunder, from amidst the "Sassenachs," the C.B.E. The Chairman proceeded to emphasise how proud the night telephonists were of their Controller and of the honour His Majesty the King had conferred upon him, and he asked Mr. Napier to accept the assurance from the night staff that they would do all in their power to assist loyally in maintaining, and even to increase, the high degree of efficiency which the London Telephone Service had attained under the able leadership of the Controller.

The toast was then drunk with musical honours, the whole company singing "For He's a Jolly Good Fellow."

In his reply, Mr. Napier humorously professed complete ignorance of the raiding habits of his supposed ancestors. He referred to his long association with the Telephone Service and said that he quite appreciated the many difficulties with which night telephonists had to contend. He wished the staff to understand that the honour bestowed on him by the King was due to the service rendered by every individual member of the London Telephone Service, including the night staff.

An excellent smoking concert followed, the various items being much appreciated.

A comedy sketch, "Ring up a Continent," written by Mr. W. J. Campbell (Foreign Trunks), and produced by Mr. B. J. Davies (Foreign Trunks), followed. It is to be hoped that we shall have the privilege of seeing more of Mr. Campbell's efforts.

The concert closed with the company joining in the choruses of old marching songs, led by Mr. R. Campbell (Gerrard Exchange) dressed in highland uniform, full marching order, rifle and bayonet.

A very enjoyable afternoon, which ended far too soon. We hope that many more such functions will be arranged by the night staff.

Another luncheon and concert, organised by Mr. R. R. Young, was held at Stanley's Restaurant, Clapham Junction, on April 27.

The gathering was fully representative of the night staff, and nearly 100, inclusive of wives and friends, took their places at 1.30 p.m. The guests included Mr. W. H. U. Napier, C.B.E., Controller, L.T.S.; Mr. J. W. Bowen, M.P.; Mr. J. Hinshelwood; Mr. G. Buckeridge and Messrs. Paterson and Leicester, of the Executive Council, U.P.W. Music was provided by the night staff's own band, the "Eureka." After an excellent repast, Mr. R. R. Young, in the chair, proposing the toast of the Controller, congratulated Mr. Napier on having the signal honour of C.B.E. conferred upon him and said in the course of his remarks that he had always found the Controller a good sportsman and ready at all times, wherever possible, to meet the wishes of the staff representatives. Mr. Napier, who was accorded musical honours upon rising, made reference to his C.B.E. and said he was the recipient of same owing to the loyal help and co-operation of the staff over the whole of the London Telephone Service. Mr. Young, in proposing the toast of Mr. Bowen, M.P., congratulated him on being appointed to the bench of magistrates for the County of London. Mr. J. W. Bowen, in a very witty little speech, proposed the health of the ladies and said that the Telephone Service owed a great deal to the wives of the staff, who, without their unremitting attention, would not always be so punctual to time in taking up duty at the exchanges, and for their general well being. Mr. Paterson responded for the ladies. Mr. J. Hinshelwood, in the course of his speech, caused great amusement by the recital of some self-composed verses in which reference was made in a very humorous manner to interviews between himself in an official capacity and Mr. Young as a Union representative. Mr. G. Buckeridge, who followed, said we were passing through a very difficult time, as everything was in a state of change, and although the Official and Staff sides looked at things from a different angle, yet the ultimate aim to improve the Service at all points was the same.

The luncheon was followed by an excellent musical programme, including community singing.

Mr. Atkins, in proposing a vote of thanks to the artistes, expressed the hope that in the near future the night staff band and concert party would be able to place their talent at the disposal of the patients at Benenden Sanatorium. And so ended a very enjoyable afternoon.

Presentation of Imperial Service Medal to Mr. W. S. Murrell.

An interesting event took place in the L.T.S. Conference Room at Cornwall House on May 19, when Mr. W. H. U. Napier, C.B.E., presented the Imperial Service Medal to Mr. W. S. Murrell, late Assistant Head

Messenger, in the presence of a gathering of his old colleagues. Mr. Murrell retired on Nov. 28, 1930, after reaching the age of 60 years, having completed 32 years' service in various departments of the Post Office.

In presenting the medal on behalf of His Majesty the King, Mr. Napier mentioned that the L.T.S. Boy Messengers' Institute had been inaugurated during Mr. Murrell's term of office in this department and that Mr. Murrell had taken a great interest in all the activities of the Institute. He had exerted a beneficent influence on the boy messengers by example and advice.

Personalia.

Resignations on Account of Marriage.

Telephonists.

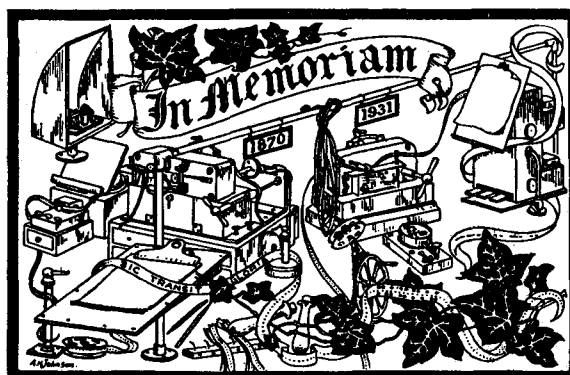
Miss M. Whitmore, of City.	Miss L. D. Brockett, of Clissold.
" D. G. Roach, of Fulham.	" G. W. Thurkettle, of Kensington.
" A. E. Sudds, of New Cross.	" N. M. Hume, of Avenue.
" G. A. Voss, of Trunks.	" W. E. Jones, of Avenue.
" H. G. Davies, of Trunks.	" L. M. Seaton, of Tandem.
" P. B. Batchelor, of Trunks.	" G. L. Cresswell, of Tandem.
" K. M. Donegan, of Rodney.	" J. I. Carter, of Central.
" E. R. Gaskin, of Regent.	" M. U. Mitchell, of Central.
" E. A. Williams, of Regent.	" M. E. A. Dansie, of Central.
" W. E. Olney, of Park.	" L. V. Torode, of Hounslow.
" K. L. Tilley, of Park.	" W. K. Manwaring, of Waltham-
" A. M. Morgan, of Amherst.	stow.
" A. J. Hill, of Maida Vale.	" E. K. Coffin, of Walthamstow.
" K. C. King, of Gerrard.	" E. N. M. Shewring, of Victoria.

"THEY CAN'T CATCH YOU ON THE AUTOMATIC!"

DOES anyone want an office boy? We know of one (with considerable experience of the telephone) who wants a job. And this is his sad story:—

Picture, then, our young friend in the City branch office of a west-end firm, with an automatic telephone, plenty of time and a mischievous brain—a dangerous combination. What fun to annoy Brown & Co., across the landing! Why not book some trunk calls and pretend they are from them—they *can't catch you on the automatic!* So throughout the day trunk call after trunk call was booked as from Brown & Co., and trunk call after trunk call was repudiated by Brown & Co. when completion was offered. But, alas, for our young friend, the telephone people are *not* so helpless as he imagined. Before even Messrs. Brown & Co.'s strong (and legitimate) complaint had been received, the line on which the trunk calls were actually being booked had been traced and was under special and continuous observation. So ended that day. The next saw a variation. Making false trunk calls was after all rather dull—one heard no more of them. Why not ring up a few people and, keeping quiet when they answer, listen to their efforts to get someone to speak? No sooner thought of than tried—they *can't catch you on the automatic!* Start with the Head Office, now the "boss's" home, now some numbers at random—great fun! Even the visit from a Post Office man making enquiries about some false trunk calls made on the previous day need cause no alarm—nor a cessation of the new game—for they *can't catch you on the automatic!*

Our scene now shifts from our youth at his merry pastime at the Branch to the firm's Head Office, where a Post Office representative asks to see the General Manager and lodges certain complaints about the city branch office boy. What proof has he of his accusations? Observation sheets record the numbers called—"Why! that's this office," "Why! that's my home." Enquiry from each verifies the false calls—and that is why our office boy ("fully experienced in the use of the telephone") is looking for another job. They *can* catch you on the automatic!



Memorial Card designed by Mr. A. H. Johnson, of the C.T.O., inscribed (inside) "To the Memory of the Telegraphic Instruments of Morse and Wheatstone, laid to rest in the year 1931 after 60 years trustworthy service on the Postal Telegraph Service."

NEWCASTLE-ON-TYNE NOTES.

WE have to record the transfer of Messrs. F. Veal and N. Wiles, Assistant Traffic Superintendents, to Bristol and Birmingham respectively.

At a gathering in the Traffic Office, Mr. A. E. Ryland, Traffic Supt., presented Mr. Veal with an artists' portable outfit, together with a golf bag, and doubtless he will find plenty of scope for their use in his new district.

Mr. Wiles was presented with an expanding suit case.

On Mar. 31, Miss Elsie Pringle, Clerical Officer, Contract Section, retired from the service in view of her approaching marriage. Mr. R. P. Lowe, Contract Manager, presented her, on behalf of the staff, with a handsome canteen of cutlery.

Yet another break to record, Miss Ursula Straughan, Clerical Officer, a popular member of the District Office staff, left us recently to take up a similar appointment at Birmingham. The members of the staff signified their regard for her by presenting her with a gold watch and ring.

The best wishes of all the telephone staff go with these officers.

LEEDS DISTRICT NOTES.

THE "Staff Meetings" session, which closed with the advent of the leave season and the arrival of "daylight saving," has been a busy one for all concerned in the arrangement and conduct of these domestic dissertations. The free and friendly way in which the why and wherefore of operating methods and difficulties were discussed was symptomatic of the interest which the meetings aroused, and is bound to result in a wider insight into the every-day problems of the service with correspondingly beneficial effects. Day operating staff meetings were held at Leeds, Bradford and Huddersfield; as many as possible of the sub-exchange telephonists being released to attend. At the same centres the problems peculiar to the night service were discussed with the full-time and part-time night telephonists. The contract officers also spent a useful hour prior to a presentation function at Leeds in an exchange of views on canvassing and contract questions.

The final meeting of the series was held in the District Office on Mar. 19, when over 100 members of the Accounts, Traffic and Contract staffs listened to an address by Mr. Murray (District Manager) on the functions of the Traffic Section and their relation to the Accounting and Contract Departments. Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster-Surveyor), was present, and in a few preliminary remarks emphasised the fuller and more effective co-operation which even a rough knowledge of the other man's work is bound to bring in its train. The discussion which followed the address was of a lively and interesting character, and could have extended to a far longer time than was available. About 80 members of the staff afterwards visited the Leeds automatic and manual exchanges and were so interested in all they saw that it was observed to be 9 p.m. before the last of the "guides" folded his tent and silently stole away.

On Wednesday afternoon, May 13, a visit was paid to the various branches of the Leeds Head Post Office by the Leeds Branch of the National Federation of Sub-Postmasters. The party, about 30 in number, was welcomed by Col. Jayne, who, in a short address, expressed the hope that the visit would be mutually beneficial in promoting co-operation between the Sub-Postmasters and the staffs of the various branches of the Head Post Office; he urged them to pay particular attention to the remodelled instrument room.

The party, at the commencement of the tour, visited the Telephone Exchange and the phonogram room. As the majority of the visitors had call offices on their premises and were concerned with the telephoning of telegrams they were particularly interested in the coin box "O" lines and in the volume of work handled in the phonogram room.

Before visiting the Postal and Telegraph branches the company was entertained to afternoon tea, and we surmised from the sounds of merriment emanating from the spot where Mr. Bownass, the Assistant Postmaster, had joined the tea party that he was indulging in a few anecdotes appropriate to the occasion.

Bradford Notes.

The report of the Commission which visited America last year to study the working of the telephone service there rightly lays stress on the efforts which are made to satisfy the numerous requirements of the subscribers. It was searched in vain, however, for guidance in dealing with the following unusual requests which reached the Bradford Exchange, and the enquiry staff had to rely—with no untoward result—on their native "gumption":—

(1) "I have had B— Mount given as an address for lodgings; can you tell me what sort of a place it is and if it will be suitable for me." (The subscriber was advised that the locality was considered "better class.")

(2) (From a call office) "I want to speak to my brother in Carlisle. I don't know his address but he lives next door to a doctor. Unfortunately I have forgotten the doctor's name."

(3) "Exchange, can you please tell me how to spell 'saxophone'?" (The information was supplied at the price of one local call.)

(4) "Can you tell me of a café where I can get a good meal and which tram-car shall I take to reach . . . ?"

(5) (One Sunday morning) "Please can you tell me what time there is a train to . . . (a very isolated village) and do I travel by G.N. or Midland?"

(6) "I have just arrived from America. I want to speak to my sister, I haven't seen her for 14 years and she is a cook somewhere in Manningham."

Promotion.—To Mr. W. D. Beardsall, promoted Contract Officer, Class I, we offer our congratulations and a hearty welcome to Bradford.

LONDON ENGINEERING DISTRICT NOTES.

LEYTONSTONE Automatic Exchange was opened successfully on Thursday, May 7, at 1.30 p.m., with a total of 1,786 subscribers' lines transferred from Wanstead Exchange, Maryland Exchange and Leytonstone Hypothetical Exchange on Walthamstow. The exchange, which was manufactured and installed by the General Electric Company, Ltd., has an initial capacity of 2,470 lines, with an ultimate capacity of 10,000 lines. The successful nature of the transfer is shown from the fact that in the tests carried out subsequent to the transfer only two subscribers' lines were found out of order. The whole of the tests were completed in 1½ hours.

New Trunk Record Positions at G.P.O. South.—A new suite of Trunk Record Positions, which has been installed on the 5th floor at G.P.O. South by the Standard Telephones and Cables Limited, in conjunction with the local staff, was brought into use on Saturday, May 9. The new positions, which are arranged in three suites, are desired for combined record and no delay work, but at present they will be worked as record positions, replacing those on the first floor. Prior to the transfer a complete test was made of every calling and record circuit, and the tests were repeated after the transfer which was carried out without interruption to the service.

The New Gamewell Fire Alarm System for the L.C.C.—The first step in the introduction of a Gamewell Fire Alarm system for London, designed to meet modern conditions, was effected by the opening of the new system in the Southwark area at 11 a.m. on Tuesday, May 5. The recording and testing apparatus was installed at Whitefriars, City, Superintendent Station and Southwark Bridge Road, Headquarters Station, by Standard Telephones and Cables Limited, the line plant comprising two junction circuits between Southwark and Whitefriars, and two street box loop circuits in the Southwark area, was provided by the Department, and testing out of the apparatus and the whole of the functioning of the circuits was also carried out by the Department in co-operation with the contractors. As the opening was an event of some importance in the history of the London Fire Brigade, the Chief Officer and a number of important officials of the L.C.C. were in attendance.

The system, which is of the closed circuit type, comprises two circuits in the Southwark area, with 28 call points in all, each circuit having a permanent current of 100 m.a. flowing in it.

Fire calls from the boxes give audible and visual indication at both stations at the same time. The system provides for uninterrupted service in the event of an earth fault or break in the street loops. It also incorporates telephone facilities for the use of the fire brigade for communicating between alarm boxes and the fire stations.

The station apparatus provides an audible repetition of the fire calls and a permanent record of each call with the date and time of the call on a paper tape. The call bells in the firemen's quarters are also actuated on receipt of a fire call.

Cricket.—The L.E.D. cricket team met the Savings Bank Department in the first round of the Curtis Bennett Shield at the Polytechnic ground, Chiswick, on Monday, May 18. Owing to bad light the game had to be abandoned before a decision was reached, and it will have to be replayed. The scores were: L.E.D. 148 (Webdale 46 and Lever 23), Savings Bank Department 77 for 5 wickets.

Athletics.—Trials were held by the Athletic Section, under the direction of Mr. F. R. Gaby, the renowned athlete, at Battersea Park track, on Thursday, May 21, to select representatives to compete in the track events at the Civil Services Sports Meeting, which will take place at Stamford Bridge on June 13.

THE Telegraph and Telephone Journal.

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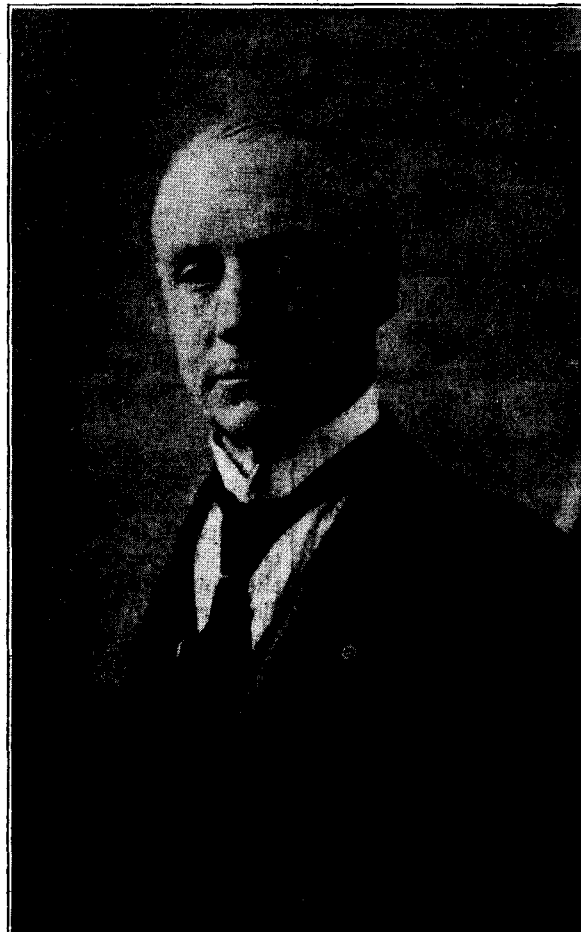
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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXXVIII.

JOSEPH HENRY STANHOPE,
M.I.E.E.

MR. JOSEPH HENRY STANHOPE was born on the stormy Ides of March in 1865, and began his career in the Post Office as a Telegraphist at Leeds in August, 1881. He was transferred to the Engineering Department in 1896, and a series of rapid promotions terminated in his appointment as Assistant Superintending Engineer in London in 1909, a position which he occupied until his retirement from the Post Office on April 30, 1925. His Post Office career covered the strenuous years of the telephone trunk transfer, the establishment of a Post Office telephone service in London, the acquisition and absorption



of the National Telephone Company's system, and the Great War. Chock-full of energy, jovial, good natured, and always ready to help, he played a great part in those great works, and was frequently commended for his services. On his retirement, still abounding in health and energy, he took over the engineering and managerial direction of the Jersey States' telephones, which he has maintained at a high state of efficiency on a sound financial basis. He is intensely loyal to his new work; so much so that each time he produces a balance sheet the item for Post Office Royalty provokes a blunt and trenchant—but always good humoured—criticism of the ethics of the Post Office and his old colleagues. How we should miss those explosions!

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE
SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

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No. 196.

TELEPHONE CHARGE FALLACIES.

RECENT correspondence in London and Provincial papers reveals that there still exists amongst a large section of the public strange misapprehension as to the method in which an exchange telephone service is supplied and the principles on which it is charged for. A correspondent deals fully with the question in an article which we publish in another column, and exposes some of the fallacies which arise when false analogies are employed in criticising service or rates. It is indeed surprising to find in these days a newspaper stating that it is "important to learn that there is no charge for installation whatever." There has been none for over ten years, and, indeed, the war surcharge was the only "installation charge" ever levied in this country for connexions within a reasonable distance of the nearest exchange. There is some confusion in the public mind between the quarterly charges which cover maintenance, interest on capital, and other overhead expenses, and the installation charges varying between £1 and £5 (and over) levied on the Continent and in America. Still more surprising, after fifty years' acquaintance with the telephone, is the failure to appreciate the fact that the Administration has to provide every subscriber with a pair of wires between his premises and the exchange, often a mile or more distant. Quite a respectable minority of the public still seem to think that any route of telephone

wires passing by their house can by some simple device be "tapped" and the service "laid on" at small cost. Hence its difficulty in understanding fully the necessity for the quarterly charge which is payable in addition to the charge for calls.

We have before remarked that the public in general is, perhaps, not in a position to understand the workings of a telephone service so well as those of other great public services, such, for instance, as a railway service. It understands something of railway companies' signalling and safety arrangements, something of their limitations; it has ocular evidence of the crowds with which they have to deal at busy hours or in holiday seasons; it can even appreciate the economic problems which necessitated the raising of their rates during and after the war. Consequently, railway service, though not quite immune, is less subject to ill-informed criticism than telephone service.

Another fallacious comparison which is often made by the casual correspondent is that between English and American rates. One encounters such vague statements as: "the rates charged in America are two dollars a month." One could almost imagine that America in the eyes of such writers was a village rather than a Continent. Certainly the charges quoted are for rural service, where in many cases the subscriber's line is an earth return circuit working on a magneto exchange. There, of course, is no such thing as "the American rate." American rates, like Cleopatra's charms, are of infinite variety. Such writers (and certainly their readers) might be astonished to learn that in New York and Chicago, after paying your six or four dollars a month (as the case may be) for a fixed inclusive number of calls, a further payment, of two dollars per month would only cover the cost of another forty or fifty calls.

HIC ET UBIQUE.

WE offer our hearty congratulations to Mr. L. Simon, Director-General of Telegraphs and Telephones, who received his C.B. in the recent Birthday honours. We congratulate also Mr. A. Sirett, the retiring Postmaster-Surveyor, of Sheffield, who gets an I.S.O.

We have received from the publishers of Europäischer Fernsprechdienst a useful atlas of nearly 50 maps, showing the trunk telephone line systems and underground networks of all the countries of Europe at their present state of development. The price of the book is only 2 marks. We have also received an interesting brochure from the German telephone cable syndicate setting forth the results of ten years' progress in Germany in trunk cable development.

The American Telephone & Telegraph Company's report for 1930 states that at the end of that year 75% of all towns in the United States with upwards of 50,000 inhabitants were connected with their trunk cable system. An examination of the conditions in this country shows that 97.2% of our towns with 50,000 inhabitants are connected with the trunk cable system.

His Majesty the King has just accepted the 2,000,000th telephone for use in Buckingham Palace. The instrument is one of the latest hand-microphones finished in old gold. As will be



seen from the above illustration, it bears a decorative plate surmounted by a crown and bearing the inscription "This instrument, installed for His Majesty King George V, is the 2,000,000th telephone connected with the Post Office system, June, 1931."

Says the *Spectator* :—

We shall be sorry indeed if the projected reform of our telephone system does not include the appointment to an advisory position in the Post Office of at least one experienced dramatist. The modern stage is served by a telephone system of almost magical efficiency. How often have we not watched, between envy and fascination, the Countess of foreign extraction (who has filched a quire of Secret Treaties and is pardonably elated) seize the instrument, manhandling it in insolent defiance of the Hints to Subscribers, and mutter into it a number largely composed of O's. She has scarcely time to bite her lip before she is speaking to her paramour, or at any rate to his butler. Throughout the ensuing conversation she clasps the mouthpiece to her midriff; yet it is plain that the words she utters are as clearly audible to her fellow-subscriber as they are to us—possibly, indeed, more so—while his own remarks, if they have to be repeated at all, are repeated by her, and not by him. The telephone represents the modern dramatist's only concession to Utopianism. Vice, crime, and folly infect every other branch of the life he depicts; the telephone alone is perfect. We confidently predict that if the Post Office's reputation is not saved by a dramatist, it will not be saved at all.

This is a sad lookout for the telephone service, especially when we remember the unremitting and unavailing efforts of the many fantastic comedians who wish to reform us.

JADE GREEN, OLD GOLD AND IVORY.

No more in sable suit alone
The omnipresent telephone,
A willing slave,
Shall stand beside us in the home.
'Twill soon be pied or polychrome,
In colours brave!
One can foresee, in future tense,
When those who have more cash than sense
Will have arrayed
A battery of telephones
In gold and rose and ivory tones
And bronze and jade,
So that a man may suit his mood
And, whether social interlude
Or business dealings
Or brief flirtation claim his time,

Appropriate hues will always chime
With his fine feelings.
For talks with an artistic clique
Whose idols vary week by week
Jade green will serve;
A brazen instrument he wants
When of financial hierophants
He tries the nerve;
He coos into a scarlet spout
When he's arranging to take out
Indulgent Queenie;
Or murmurs in an ivory horn
His dreams of a chaste love, new born,
For slim Irene.
But when his creditors and such
Folk as he loves not overmuch
Claim his attention,
Nothing can be too sable-hued
To harmonise with his dark mood,
And that the old black telephone
Then comes once more into its own
I scarce need mention.

W. H. G.

DEVELOPMENTS IN TELEVISION.

LECTURE GIVEN BY W. G. W. MITCHELL, B.Sc.,
Hon. Secretary of The Television Society, before The Royal Society of Arts in London, on Wednesday, Feb. 25, 1931.

EARLY experimenters in the field of television were handicapped through not having suitable photo-electric cells for converting changes of light and shade into corresponding electrical impulses, and also through the modern valve amplifier then being unknown. But the last 5 years have shown that a primitive form of television is physically possible.

The fundamental difficulty in television is the time factor, for each scene that is transmitted has first to be scanned or drawn out into a long "ribbon" of light and shade, and then at least 16 or 18 complete "ribbon" representations of the scene have to be sent out every second, otherwise there is troublesome flicker at the receiver. It is not possible to transmit each complete picture as a "packet" of light impressions, and modern developments show a tendency to compromise between the "packet" and "long ribbon" methods by treating each picture as a number of zones and using a separate transmission channel for each zone.

Dealing with the difficulties of sending extended scenes, the lecturer thought that some form of "photographic pick-up" such as a film would have to be used in future for recording and storing pictorial events as a partial solution of the optical problems involved. The principle of "vignetting" a picture so as to send only the centre of interest in finer detail, would assist transmission difficulties in radio, where already the synchronising picture-frequency signals imposed an extra strain on the radio channel. At the transmitting end the modern photo-electric cell had reached a high state of development, and in response it nearly approached the human eye, but at the receiving end some more efficient form of light integrating device other than the neon lamp was needed.

As examples of the trend of development, the lecturer dealt with the recent demonstration of two-way television in America, the various attempts made to produce a large screen picture suitable for viewing by large audiences, and the attempts that had been made to overcome purely mechanical methods by using electrical ones. The American Telephone & Telegraph Co., who were responsible for the two-way television system, were primarily seeking information as to the value of the addition of sight to sound in personal conversations over the telephone. The extra apparatus for providing vision is bulky and the operating costs are heavy but further development work is in progress to reduce these defects. Speaking of large screens, the lecturer had recently seen demonstrated, by J. L. Baird, an arc lamp whose intensity was modulated directly by a vision signal. Very good brilliancy was obtained on a screen 7 ft. by 3 ft. at 10 ft. distance by optical projection.

There was hope of purely electrical methods, such as the cathode-ray method, becoming more widely used as soon as the high voltages required for operating could be reduced. But the lecturer looks for the next big development in the direction of zone methods used in conjunction with wired transmitting circuits. Using these methods, it should be possible within a year or two to have a picture of the size and brilliancy of the cinema screen picture of to-day. The Home Televisor, possessing real entertainment value, will probably only come some years after this and as a development of it.

LONG DISTANCE TELEPHONY.

J. F. DARBY (*Headquarters Traffic Section*).

(VIII.)

THE problem of the design of trunk equipment for the introduction of demand working in Great Britain has been one of considerable interest from both engineering and traffic aspects. The time factor—the need for the early introduction of the scheme—has been an important consideration. The question of linking up the new system with the existing one has had to be met, and the need for standardised apparatus suitable for the varying conditions and classes of traffic to be handled has had to be fully borne in mind.

CORD CIRCUITS.

The initial investigations carried out by the Department's engineers lead to the conclusion that a new type of cord circuit, different in main principles from the types of cord circuit hitherto in use in Great Britain, was desirable in order to meet the requirements in connexion with transmission, signalling and other traffic facilities. This cord circuit is of universal application, being suitable for outward, inward and through trunk operating positions. (Tandem switchboards will, of course, have a cord circuit on a plug ended principle, suitable for straightforward junction working.) The main principle involved in the design of the new cord circuit is that the signalling element is removed from the cord circuit and associated with the trunk line terminal equipment. The cord circuit is of symmetrical design, i.e., the answering and calling cords are fully interchangeable. The main facilities provided are:—

- (a) Ringing on either cord—key per cord circuit.
- (b) Dialling on either cord—master dialling key ([D] on diagram).
- (c) Keysending on either cord—master start key, associated with the key-set.
- (d) (i) Speaking on both cords—key per cord circuit.
(ii) Speaking on each cord separately—master 'splitting' key ([C] on diagram).
- (e) High impedance monitoring—key per cord circuit.
- (f) Facilities for transferring calling signals from normal answering position to another position—master transfer key ([B] on diagram).
- (g) Facilities for associating 'elapsed time display' with any cord (outward positions only)—key per cord circuit.
- (h) Steady clearing signals on supervisory lamps from subscriber's switch-hook clear and flashing signals on supervisory lamps from generating signalling equipment.
- (i) Position coupling—master key ([A] on diagram).
- (j) Non-through signalling facilities when used for a normal trunk connexion but through signalling facilities when used for extending a call to another position for control.

Master keys are, in all cases, used in conjunction with the speaking key of the cord circuit on which the facility is required.

No doubt a full description of the circuit will appear shortly in one of the Post Office technical journals.

KEYBOARD LAYOUT.

The general layout of the keyboard has been considered, having regard to the provision of space for:—

- (a) 12 cord circuits for incoming and through positions. (Capacity for 14.)
- (b) 6 cord circuits with time display keys for outward positions. (Capacity for 7.)

- (c) Visible index file for routing and rate information.
- (d) Glass plate panel for switchboard notices, with adequate space for writing.
- (e) Keyset or dial.
- (f) Pneumatic tube inlet valve.
- (g) Two strips of ten order wire keys. (Temporarily, until straightforward junction working is introduced universally.)
- (h) Instruction key and lamp.
- (i) Receptacle for tickets.
- (j) Spring ticket clip for holding tickets in association with the relative cord circuit. (Outward positions only.)
- (k) 'Time check' lamps on outward positions—to indicate the elapse of 3-minute periods.

An illustration of the general layout adopted for London is given. Keys (1) and (2) will not normally be provided, the space being utilised, when necessary, for order wire keys. In the case of outward positions, the even numbered cord circuits will be omitted and the place of the ringing key of these cord circuits will be taken by a time display key (see cord spaces 7 and 8 in the diagram). The keyboard has been designed on the basis that the common *lamp display* timing device mentioned in Article II of January last will be adopted as standard for inland trunk working. This device will give a visible display (just as long as a time display key is operated), on a common strip in the panel, of a figure or figures indicating the elapsed time rounded up to the nearest chargeable minute on the call in progress on the particular cord circuit associated with the time display key operated. If a conversation has finished the display will indicate the chargeable duration; the timing mechanism associated with a cord circuit will be stopped by the replacement of the calling subscriber's receiver on the switch-hook.

It will be observed that veeder clocks and calculagraphs have not been included. Exchange clocks, suitably placed, will be used by operators for ticket records and other purposes connected with operating.

The width of the positions is approximately 2 ft. 3 in., the exact dimensions being arrived at by the provision of 7 C.B.10 panels per section of 3 operating positions. This wide (compared with normal C.B.10 section) position will be introduced at the large trunk exchanges; it was decided upon to provide ample room for equipment and adequate space for running pneumatic tubes from the keyboard to the floor at certain intervals along the switch sections. There is a further point that the wide keyboard gives greater spacing between operators—a desirable arrangement where very long distance channels are being operated. At the smaller trunk exchanges, i.e., the present group centres which will become trunk control centres under the demand system, it is proposed to use a position of the same width as the C.B.10 section in order to provide flexibility for the rearrangement of positions when necessary; in exchanges of this class, the trunk and local switchboards are usually accommodated in the same room. The reduction in width will be effected by providing one visible index file between two positions. In the case of provincial exchanges, it is proposed to provide a slight modification of the arrangement (but not the position) of the keys of the cord circuits to conform with the operation of keys on existing manual and auto-manual boards in order to reduce to a minimum any difficulty which an operator may experience in taking turns of duty on the new and existing types of boards. In other respects the layout indicated will be standard for all new trunk exchanges.

PANEL EQUIPMENT.

The $\frac{1}{2}$ -in. jack strip and $10\frac{1}{4}$ -in. panel of the C.B.10 type, with a repetition of the multiple every 6 panels, have been decided upon for standard trunk equipment. The number of panels per position will be $2\frac{1}{3}$ and 2 for the wide and normal keyboards respectively.

It is proposed to adopt visual idle indicating signals in connexion with all outgoing trunk (delay basis) multiples. The system is being developed on the lines of the American scheme, with the provision of lamps behind the designation strip. The designation strip will be perforated with a $\frac{1}{16}$ -in. hole, with a coloured, translucent, material (red or green) placed behind. When a lamp behind the strip is lit, a small coloured spot will appear on the designation strip. It is anticipated that the arrangement will produce a well-defined signal—small and without glare. A point of advantage with this arrangement is that additional multiple space is not absorbed by the visual signals, as is the case with the present visual engaged system.

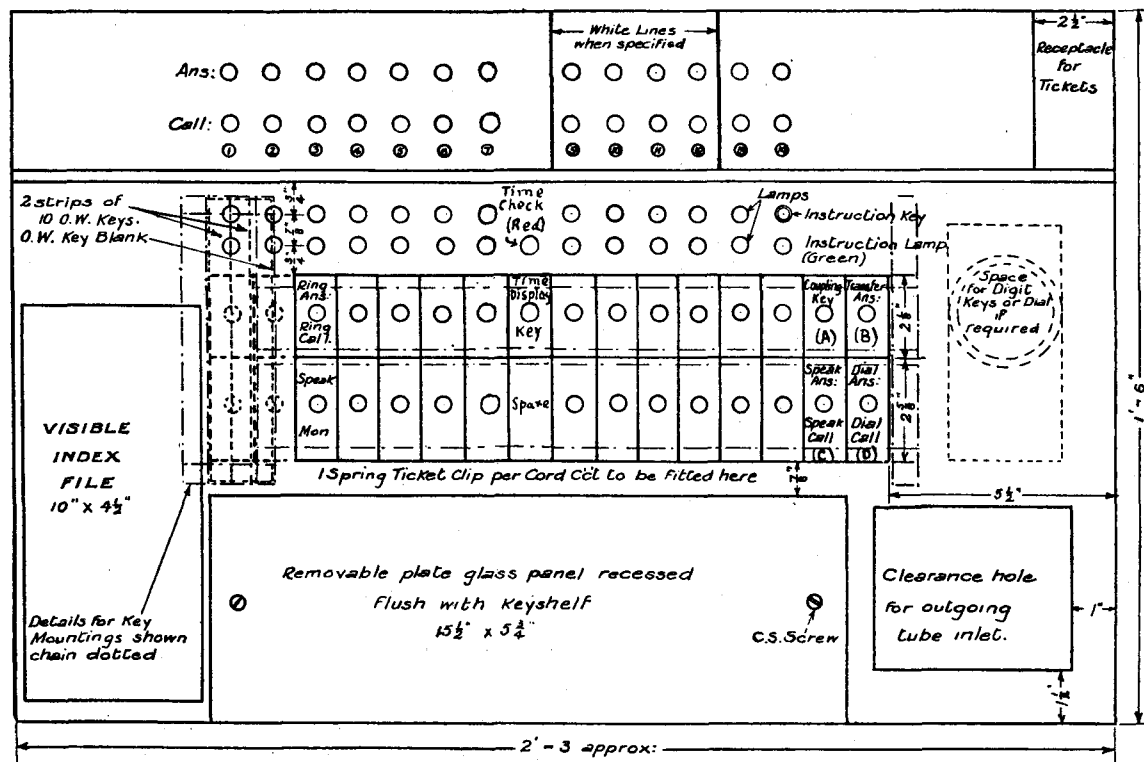
It is proposed, also, to provide a lamp signal (special control signal) at the commencement of each group of trunk circuits which can be operated, when required, to indicate abnormal delay and the introduction of special control working on a particular route.

Consideration is also being given to the provision, on the calling lamps of recording circuits, of 'flicker' and 'flash' signals

since calls are not normally reversed from demand positions to automatic exchanges.

This point has an important bearing on the height of positions and it seems that, in the case of provincial automatic centres, where the trunk (delay basis) circuits are not numerous, a switchboard of the height of 4 ft. 6 in. will be adequate. (A board of this height will be useful for installation along the centre of switchrooms, when space considerations necessitate such a course.) It will be appreciated that with a 6-panel multiple with 20 jacks per strip, 120 trunk circuits, with designation strips and visual idle indicating signals, will only absorb 1 inch of multiple as far as height is concerned.

The photograph given in the June issue of this journal illustrated trunk switchboards of a height of 4 ft. 6 in. installed in the London trunk exchange. In this particular case the height was regulated by structural considerations in connexion with the Carter Lane building. These positions will be used shortly as demand positions to serve automatic exchanges only; a multiple of the trunks to



to indicate signals which have persisted for 10 and 20 seconds respectively without attention having been given, with a view to eliminate the 'unfortunate' call, i.e., a call which, at times of pressure, all operators overlook. Owing to the lack of accommodation space in London trunk exchange building, it is unlikely that this facility will be available during the initial stages of demand working in London.

Accommodated in the panels over trunk positions will be multiples of (i) trunk circuits (delay basis), (ii) no delay trunks and junctions serving the 'no-delay' area of the trunk exchange, (iii) service lines, and (iv) interposition junctions (to give access from any one trunk position to any other trunk position in the same exchange).

A point of interest in connexion with item (ii) is that only a limited multiple of the no-delay trunks and junctions is required over demand positions when these are split up into two or more suites. For example, if a demand suite receives demands from exchanges A, B, C and D exclusively, then it is only necessary to provide an outgoing multiple back to these exchanges, for reversing connexions where necessary. If the exchanges A, B, C and D are automatic, the number of circuits required from the demand positions to these exchanges will be very small indeed,

the large provincial centres will be provided on them—access to the remaining trunk circuits will be obtained via trunk tandem positions.

PNEUMATIC TUBES.

From demand positions it is proposed to provide access to two outgoing pneumatic tubes at the larger trunk centres. One tube will be used for completed tickets and will go to a *ticket filing* position; the other will be used for tickets not completed and terminate on a *ticket distribution* position. From the latter position tubes to the various delay positions will be provided on the basis of one incoming per two positions. One tube (inlet valve on keyboard) will be provided for the disposal of completed tickets from delay positions to the ticket filing position. In actual practice a single outgoing tube will probably only serve, say, 10 to 12 positions—the inlets being in parallel on the tube. A number of tubes will, therefore, be necessary to function in place of the single outgoing tubes referred to above. On the initial suite of demand positions installed in London, the two outgoing tube inlets have been accommodated in the panel. On future positions, one tube inlet valve will be provided on the keyshelf (as indicated on the diagram). The second inlet valve will be accommodated in the panel—one valve for two positions being provided.

OVERSEAS EXCHANGE.

Mention might perhaps be made of one or two of the special features of the equipment of the new *overseas* exchange.

The keyboard and panels will be of the same design as for the inland trunk sections. The number of cord circuits will, however, be reduced—5 only being provided on outward and both-way *continental* positions and 8 on inward. There will be some elaboration of the system of timing proposed for inland trunk positions. The position of the time display keys will be the same, but a modification will be made in connexion with the 'elapsed time display' in the panel. In place of a *common* elapsed time display for all cord circuits, *three* separate displays will be provided, one which can be associated with the first two cord circuits, the second for association with the next two cord circuits and the third for the fifth cord circuit. It is unlikely that an operator will control more than three outward calls simultaneously and, of the two cord circuits served by one display, only one will be used at any one time for outward controlled traffic.

The continental elapsed time display will consist of a strip of 20 lamps placed behind a translucent designation strip upon which is indicated the numbers 1 to 18. A number is only displayed when the lamp immediately behind it is lit. A distinctive colour will be given to each elapsed time display and its associated cord circuits, so as to reduce, to a minimum, any error in associating a display with a particular connexion. The white lines indicated on the diagram adjacent to cord positions 9 and 12 are provided for the purpose of assisting operators in the association of cord circuits with the corresponding displays.

The working of the continental elapsed time displays will be, in principle, that the continental controlling operator having set up a connexion, upon hearing conversation satisfactorily commenced, operates the time display key associated with the cord circuit in use. Upon the particular elapsed time display in the panel associated with the cord in use, a figure will be 'thrown up' corresponding to the elapsed conversation time rounded up to the nearest minute. As the call proceeds the figure indicated will change, in the first instance from 1 to 2, as soon as the second minute of conversation has commenced, then from 2 to 3 on the commencement of the third minute, and so on. The operator has, therefore, always before her a visible indication of the chargeable elapsed time. The mechanism associated with the elapsed time display will be stopped at the moment the calling subscriber replaces his receiver (where through switch-hook supervision is available). It has been arranged that, for a period of approximately 12 seconds before the display changes from one figure to the next, the steady glow of the lamp illuminating the figure on the display will change to a flicker. The operator will give high impedance monitoring during this period and satisfy herself that conversation is ensuing as the *next chargeable period matures*, i.e., when the figures change, say, from 6 to 7 or 8 to 9, the operator will listen to hear if conversation is taking place. With this arrangement, the monitoring of the connexions will be regulated and the risk of overcharge to subscribers rendered almost negligible. A 'time check' lamp will be provided as in the case of inland trunk positions.

The timing and cord circuit arrangements for the new *inter-continental* positions are still under consideration.

Separate record positions will be provided for (a) *Continental* and (b) *Inter-continental* services, demands being received in the first instance at the *inland demand* positions whence they will be switched to the appropriate overseas recording positions.

The continental record work, which will be carried out during the busy hours on special record positions (also to be used for enquiry work), will be divided according to the languages most commonly used for operating overseas services; three groups will be formed—English, French and German. (The segregation will

be carried out at the inland demand positions, three groups of circuits being provided from the demand positions to 'continental records'.)

Facilities are to be provided so that, outside the busiest hours, the continental record circuits can be diverted to the controlling positions, each group, English, French or German, can be switched over separately. This arrangement will admit of service being given on demand outside the busy hours; the facilities will be such that the calling subscriber can be held in suitable cases while connexions to the continent are set up and, on calls from subscribers on automatic exchanges, through signalling will be given from the subscriber's switch-hook via the inland demand position (on which the connexion has been switched) to the controlling operator on the continental suite. In the case of calls from subscribers on manual exchanges, the connexions will be reversed by the continental operators while holding the subscribers on the original connexions.

In the case of *Inter-continental* calls, the record circuits will be terminated at all hours on the actual controlling positions of the inter-continental switchboard. The position will also have a multiple of all inter-continental, continental and inland trunk circuits and the setting up of inter-continental calls should be facilitated by the speedy connexion of the European subscriber.

TRUNK SUBSCRIBERS.

A word might be said about the equipment for *trunk subscribers* (subscribers renting direct circuits to the trunk exchange). The new London trunk positions, inland and overseas, will have capacity for accommodating a multiple of the outgoing side of these circuits, the incoming side being terminated on demand positions.

Under the new conditions a very expeditious trunk service should be given to these subscribers.

MODIFICATION OF EXISTING EQUIPMENT.

In view of the introduction of a new type of cord circuit, as indicated earlier in this Article, it has been found simpler and quicker, as far as the larger centres are concerned, to provide a suite of new positions with the new cord circuits and associated apparatus as an initial installation, to enable a start to be made with the demand system. This arrangement allows a limited demand service to be given, i.e., on the new positions, trunk calls originated within a *limited* area around the exchange are set up on demand to certain *selected* distant towns; all other calls are recorded in the normal manner (the subscribers being released) and the tickets sent to the old trunk signalling sections for control. Certain of the old trunk sections will thus be thrown spare and will be available for modification to bring them into line with the new positions as regards cord circuits and line terminal equipment. For example, at Leeds, Newcastle, Bristol (new switchroom), Nottingham and, probably, Glasgow and Liverpool, new suites of outward positions (to be interchangeable for demand or delay working) will be installed in sufficient numbers to permit of the opening of a demand service from these towns to the main zone centres. The modifications of the existing boards will thus be undertaken in stages and the demand system correspondingly developed both as regards the local areas served and the distant towns embraced in the scheme. These initial stages will involve working routes unidirectionally and without full alternative routing facilities; the greatest efficiency in the loading of circuits cannot, therefore, be attained at once. If, however, the complete scheme is brought into force in a reasonable time, as is expected, with common groups of both-ways circuits and full alternative routing facilities, no adverse effect on the financial aspect of the scheme should result from the temporary expedients adopted for introducing the system.

(To be continued.)

TELEGRAPH DEVELOPMENT IN S. AFRICA.

THERE have been considerable changes in the South African Telegraphs during the past eighteen months, and this short article will give some account of these changes and recent developments.

Steady progress in the mechanisation of main routes has taken place and there has been an increase in the number of teleprinter circuits worked with instruments of Morkrum type, in some cases with automatic transmission. An example of this is the Capetown—Pretoria circuit, an aerial wire 1,000 miles long with two repeaters in circuit which is giving satisfactory results under good line conditions. Another line, even longer, on which teletype working is being tried is the Capetown—Durban circuit. Teletype working between Johannesburg and Durban has been in operation for a few years, but later types of instrument have been installed, and whereas two of the circuits were on composited lines of the Johannesburg—Durban telephone carriers, they are now operated on wires clear of the carrier system. The working on these circuits was thus not only improved but the telegraph repeaters at Dundee Natal were rendered unnecessary. The majority of the main lines of the Union are now either multiplex (Western Electric type) or teletype, and in a few months' time the remaining principal routes will be machine equipped. The creed system is still extensively used, chiefly for press disposal, but systematic creed working is also in operation on certain commercial circuits. It is intended to instal fast teletypes at least on some of the news lines as soon as apparatus is available.

The Southern Rhodesian Administration installed repeaters at Mahalapye in Bechuanaland on the Union—Rhodesian lines in 1929, and creed working at fairly high speed was introduced between Bulawayo and the two chief Union centres, Johannesburg and Capetown. Delays between the two countries were thereby much reduced and the service greatly improved.

In October, 1930, most important changes were made in the Union. Up till this time practically all the overseas traffic circulated via Capetown where it was handed over to the Eastern and Beam Companies, later to the Overseas Company when the two services were merged. A very large percentage of this traffic originated in Johannesburg with its large financial, mining, and commercial interests, and the desirability of a direct line to Johannesburg for this traffic has been often discussed. The project materialised in October, 1930, when a direct circuit, worked systematic creed duplex, was opened between the C.T.O. Johannesburg and the Overseas Communication Company's Office in Capetown. As through serial numbers were arranged between London and Johannesburg and this traffic is transferred by Capetown Overseas a direct Johannesburg—London circuit was in effect established. As a result of the opening of this new route all inward traffic from the Overseas Company, with the exception of that for Capetown and its immediate area, now circulates via Johannesburg for onward transmission. A certain proportion of the outward traffic is still routed via Capetown but the larger portion goes via the Johannesburg circuit. A heavy traffic is handled on this circuit as it also includes the whole of the Overseas work to and from Rhodesia and the Territories beyond, and a considerable portion of that from Natal formerly dealt with by the Eastern Company at their Durban station. In consequence of the merger referred to, the Durban cable office has been reduced to a purely transmitting office, mainly for the Australian cables, with a small staff and all overseas messages from Natal and other parts previously handled by the Company there are now taken by the Department who have given additional facilities for acceptance at Durban. An extension of facilities was given at Johannesburg on the inauguration of the direct Overseas line.

The average number of messages transmitted on the Overseas line is about 1,830 for an open period of 17 hours, while on Christmas Eve for the 24 hours, no less than 7,130 messages were dealt with, there being of course a large number of greetings messages (XLT) in this total.

A further change made in 1930 was the cessation of direct communication between Rhodesia and Capetown and the trans-

mission of all Union—Rhodesia traffic at Johannesburg where two circuits worked creed are available to Bulawayo. In addition to this increase of traffic at Johannesburg due to the overseas line and the Rhodesian transmitting, there was a further transference of inland transmission to that centre.

The scheme of concentration on a number of "major offices" somewhat analogous to the zone centres in the British Service is now complete. It involved the abolition of a number of minor transmitting stations and the disappearance of the last of the old transmitting centres—Kimberley—as a large telegraph office. The six "major offices" are Johannesburg, Capetown, Durban, Port Elizabeth, Bloemfontein, and East London.

In July, 1930, there was a general introduction of the Phonogram service and it is steadily expanding.

Notwithstanding the economic depression the Christmas traffic, which is such a feature of the South African telegraphs, was well up to average as the following figures for Dec. 24 for the last two years at the chief centres show:—

	1929.	1930.
Johannesburg ...	74,580	75,183
Cape Town ...	67,156	55,554
Durban ...	25,949	25,514
Port Elizabeth ...	18,134	19,666
Bloemfontein ...	17,442	18,872
East London ...	14,100	11,936

E. E.

TELEPHONE PERSONALITY.

IN a review in the *Manchester Guardian* of Professor Pear's book, "Voice and Personality," Mr. E. G. D. Liveing, of the B.B.C., makes an interesting contribution to the technique of telephony as it affects the commercial user. He points out that broadcasting has led to the development of a new technique of speech, whereby a speaker endeavours to convey to unseen listeners his personality and emotions without the aid of facial and bodily gestures used in normal conversation. Listeners also have acquired a new technique which enables them, by the sense of hearing alone, to form a mental picture of the man who addresses them, so that the sound is no longer "vox et praeterea nihil." Mr. Liveing then makes the following interesting comment on the telephone:—

"But this matter of voice and personality is one that hardly anyone to-day can brush aside lightly as one that has no particular bearing on his own life and business. At some time or another nearly everyone has to use the telephone. To anyone engaged in business it has become an indispensable necessity, and the introduction of transoceanic telephony during the last few years has placed an added tax on the vocal capacity of "leaders of industry." How many business negotiations are successfully concluded, or fail, as the result of ability, or inability, not only to express ideas in telephone conversation, but also to convey personality and personal reactions in regard to questions arising during the conversation? Flexibility of vocal intonation is absolutely vital to the "telephone personality," and to the successful use of the instrument. How many of us engaged in business and professional pursuits possess it, or have attempted to cultivate it consciously? This, surely, is a question of no small practical importance to individuals, to business firms, and to industry in general."

Telephone administrations have been accustomed to select operators after vocal tests and to train their voices so as to secure not only clear enunciation but to convey to subscribers a certain measure of sympathy. This is probably the first time an outsider has pointed out that the development of a good telephone voice and manner is equally desirable in a subscriber. It has been said with truth that the average man is at his worst when attempting to argue or convince over the telephone, and it is encouraging to find that the need for developing a telephone technique is recognised outside telephone circles. Some day, perhaps, it will be admitted that subscribers should have a special training, and then the telephone millenium will be drawing nigh.

TELEGRAPHIC MEMORABILIA.

THERE is much interesting matter which must be left over until next month, if not indefinitely, owing to the pressure upon space all round. One would like to have scribbled a few lines on Broadcasting House, and a few lines also—or if not a few lines, then a few paragraphs, on the centenary of that pioneer of Printing Telegraphy, Professor Hughes. Circumstances have therefore stayed my pen for which there may be not a few unuttered thanksgivings! It seemed necessary, however, to give these personal explanations in case it should have been presumed that subjects such as those just mentioned, had been ignored by the present writer. If other and better qualified pens than mine have fortunately contributed matter on these subjects, then please, Mr. Editor, omit these apologetic lines.

Personal.—Sir Thomas Purves, Engineer-in-Chief of the Post Office, a past President of the I.E.E., has been installed as President of the Burns Club of London.

Sir John Reith, Director-General of the B.B.C., while studying the broadcasting system of the United States of America, took advantage of the opportunity, in his lecture there on "Radio in Education," to point out certain differences existing between the services in the U.S.A. and those in Great Britain. "One of the chief motives of central control in Great Britain," said Sir John, was "to secure coverage for the whole country in a qualitative as well as a quantitative sense."

Among the Birthday Honours, outside the Home Services, are noted that of Mr. H. A. Sams, Indian Civil Service Director-General of Posts and Telegraphs to be a knight, and the conferring of a C.M.G. upon Mr. H. A. Mayne, Inspector-General of Telegraphs and Telephones, Egyptian Ministry of Commerce.

The late Mr. William E. Gray, joint managing director of the India Rubber Gutta Percha & Telegraph Works Co. Ltd., left estate valued at £90,471 gross.

Col. A. S. Angwin, D.S.O., M.C., is the new chairman of the Wireless Section of the Institution of Electrical Engineers.

Companies.—The International Telephone and Telegraph Corporation declared a regular quarterly dividend of 50 cents per share, payable July 15. The Globe Telegraph & Trust Co. Ltd., have declared a final dividend of 3s. 6d. per share net, on Ordinary shares, making total payment for year of 8½% as against 10%. The Eastern Telegraph Co. Ltd., dividend at the rate of 3½% per annum, less tax on preference stock for the quarter ended June 30 last, has also been announced.

Countries.—AUSTRALIA.—From Reuter's agency and other sources it is learnt that the Federal Government has refused to ratify the agreement between the Amalgamated Wireless (Australia), Ltd., and Imperial Communications, Ltd. The announcement was made by the P.M.G., and the reason given was that the merger was opposed to the Ministry's policy of nationalisation of the great public utilities. During 1930 the Commonwealth Telegraph Department reduced expenditure by £67,465, but the revenue decreased by £77,519. The ratio of telegrams to population was higher than that of any country of the world, excepting New Zealand, but "the telephone service did not progress during the year at the same rapid rate as in former years," says *The Electrical Review*. In a review of broadcasting finance for last year, Mr. C. J. Cerutti, the Australian Auditor-General, states that the accounts of the Australian Broadcasting Co., Ltd., for the period ended June, 1930, showed a net loss of £4,896. Receipts amounted to £151,943 and expenses to £156,839. Under the system now in force and inaugurated last year, the listener's licence fee of 24s. per annum is distributed as follows: 3s. to Amalgamated Wireless (Australasia), Ltd., 9s. to the Postmaster-General, and 12s. to the Australian Broadcasting Co., Ltd., for programmes.

BELGIUM.—The receipts from the Belgian telegraph system showed a further decline last year, says Mr. Reyntiens, the Commercial Secretary of the British Embassy, Brussels, but the

telephone continued to advance. The Belgian Government is now actually engaged in the adaptation of the radio installations at Ruyssede and Liedekerke to the Beam system. As these lines go to press, it is announced that direct radio-telegraph communication has been established between Brussels and Buenos Aires.

CANADA.—Reuter's Trade Service, Regina, reports that "wireless is to assist in forest fire protection in Northern Saskatchewan, the provincial forestry department having decided to establish a system of look-out towers equipped with short-wave sending and receiving sets to supplement the aerial patrol which has been effectively used in recent years." Radio has also raised a constitutional question in Canada, viz., "Does the control and regulation of wireless transmission and reception come within the jurisdiction of the Dominion or the Provinces?" "For three days," says Reuter's Ottawa correspondent, "counsel dealt with the intricacies of the question before the Supreme Court of Canada, and at the conclusion of the argument, judgment was reserved." The case fundamentally involves the scope of governmental authority between the provinces and the Dominion, and in actual discussion embraced such matters as "the nature of radio waves and the uses to which radio is now put or may be directed in future." Verily a sufficiently wide field to cover! The Dominion Parliament holds the highest card in that it has, up to the present, assumed control and has entered into international treaties and agreements respecting the allocation of wavelengths. It has also enacted a law prohibiting the operation of a radio receiving set without a licence. It was the province of Quebec which challenged the Dominion's right to control, Ontario and New Brunswick in the main supporting Quebec. The fact that, under the present regime the popularity of broadcasting is steadily increasing—the radio sets are increasing at the rate of 100,000 a year is the latest report—should strengthen a general desire to let well alone, and to retain the present authority. A further question has also been satisfactorily settled—at least to the honest owners of receiving sets—in that the Canada Evidence Act has been so amended as to facilitate the prosecution of offenders who dodge the Government licence fee of one dollar. The *Electrician* records the statement that the new carrier current system on the Canadian National Telegraphs cable, between Toronto and Winnipeg, has a capacity of 9,600 words per minute.

CEYLON.—The Colombo broadcasting station is situated on the outskirts of the town at Welikade. At the moment the ordinary coast station is modulated for broadcasting purposes, but, according to *World Radio*, a new transmitter is nearing completion which will be used solely for broadcasting. A c.w. telegraph transmitter is also in operation in the same building, and, so it is said, it is hoped to modulate this, and to carry out experimental short wave broadcasts of the Colombo programmes. The number of licensed listeners is not more than 1,600, says the same authority, and while it is noted that "a considerable amount of receiving apparatus is imported," it is dolefully added, "which is totally unsuited to the climatic conditions. Country of origin unknown."

DENMARK.—According to a report on *The Economic Condition of Denmark* in general, issued by the Department of Overseas Trade, it is recorded in connexion with Radio Communication, that the number of licensed owners of radio receiving sets continues to increase at the rate of 25,000 per quarter. *Annual Report of the Great Northern Telegraph Co. Ltd.*—Despite the payment of a dividend of 20% to its shareholders, there is an uneasiness in the tone of this report regarding the future of international telegraphy as a paying proposition, for, speaking more especially of the Company's relations with Eastern and Far Eastern administrations, the report makes the following very significant remarks: "Several governments from which the company holds concessions have opened, or contemplate opening, wireless services in competition with the company's cables. The latter, questions whether it pays them financially to do so and whether the time is not coming when there will be too many international telegraph routes altogether by wire and radio."

The congress of the International Consultative Committee on the Technique of Radio Communication and of the International

Radio-Scientific Union, which opened at Copenhagen on May 27 last, continued its deliberations until June 8. More than thirty countries were represented at the Congress. The British delegation was headed by Col. A. G. Lee. No less than thirty representatives of the United States were present, and were led by Mr. Wallace White, a member of the House of representatives.

FRANCE.—The Radio-Normandie station, which has hitherto been transmitting on a wavelength of 220 metres, is now using the wavelength of 219.9 metres (1,364 kc.). The new station at Pontoise, constructed with the object of providing the French colonies with news, says *The Electrical Review*, will shortly be transmitting regularly on a wavelength of from 19 m. to 25 m. It has a power of about 13 kw., three masts, and two transmitters which are stabilised by crystals, and will work separately or simultaneously. There is a special auditorium at the Colonial Exhibition in Paris, and at this moment it is being announced as "Poste C 12,000." The tramway authorities of Oran are making a determined effort to cure radio interference caused by their tram systems. Steps are being taken to mitigate, if not eliminate, the trouble. *World Radio* reports that pylons are being erected on the roof of the Ministry of the Interior in the Place Beauvis, Paris, and it is understood that they are to be used for enabling the police to communicate orders and information by wireless to various parts of France and abroad.

GERMANY.—On May 31 the power of the broadcasting station at Königswusterhausen was raised to 75 kw., comparing with the 35 kw. of the former transmitter. On the same (Hague) rating, Daventry (5XX) transmits 35 kw., the Midland regional station, 38 kw., and the London regional, 68 kw. *Medical Wireless Service*.—The German medical authorities have established a radio coastal station, "Elbe-Weser-Radio," through which any ship can obtain medical advice. Such calls for assistance, as we are informed by Philips Lamps, Ltd., are connected directly through the new station to the National Hospital at Cuxhaven.

GREAT BRITAIN.—*Tracking Wireless Defaulters*!—Eight districts have been covered by Post Office "direction-finding" vans, which are equipped to locate unlicensed receiving sets, and, according to the *Morning Post*, the total increase in the number of licences issued during the operation periods, as compared with the corresponding periods of last year, was approximately 22,000. It was recently stated in the House of Commons that there were 1,433 prosecutions for the use of wireless sets without licences in the year ended Mar. 31 last. The fines imposed amounted to £1,100. From 1925 to the end of 1930 over 5,000 prosecutions took place. *Interference*!—No. 341 of the *Tramways, Light Railways and Transport Journal* contains an interesting statement concerning the record of the attempts being made by the Post Office Engineering Department and the Association to reduce the interference of trolley-bus and tramway systems with radio reception, together with a list of towns where steps have been, and are being, taken to modify the traction systems with that end in view. *The B.B.C. and a Magnetic Recorder*.—Experimental use is being made by the B.B.C., according to *The Electrical Review*, of a special piece of apparatus known as the *Magnetic Recorder*, which carries the spoken record of "all that is spoken or done over the wireless" in the form of magnetic impressions on a long steel tape. The latter winds itself on a spool; a programme just recorded can be reproduced and, if desired, re-broadcast at a moment's notice. *Television by Daylight* was the heading of a half-column in the London *Daily Telegraph* issue of May 9, and which recorded "One more step in the advance of television into the life of the man-in-the-street," upon the occasion (May 8) when street scenes in the neighbourhood of Covent Garden, in broad daylight, were picked-up and successfully reproduced, under laboratory conditions, by the Baird Television Co. The *Electrician*, however, reports that "The first outside broadcast of television was carried out by the Baird Television Co. on the occasion of the Derby, when the transmission was satisfactory. *Re-diffusion*!—The matter of re-diffusion or exchange systems of broadcasting and reception during these last few weeks has proved

somewhat chequered as regards its ready acceptance by local bodies. At Rotherham the necessary permission has been obtained, while the Urban District Council has refused permission to the Bradford Radio Relay Co. to provide similar facilities in the case of Otley. The Exeter Radio Exchange is well on the way with its wireless relay service, but in the case of an offer of Broadcast Relay Services Ltd. to establish Communal Reception in Edinburgh, "No Action" was recommended by the sub-committee of the City Corporation.

According to *The Electrical Review*, two "limited" companies have designed a new water-cooled valve, rated at 100 kilowatts, and are the first of their type and size to be entirely designed, developed, and manufactured in England. The anode is a solid copper tube cooled by a jacket through which water circulates at about 500 gallons per hour. The filament leads, owing to the heavy current they have to carry, are also water-cooled. The following interesting figures are given: Valve 3 ft. 6 in. long, weight 18 to 20 lb., anode diameter 4 in.

IRISH FREE STATE.—An interesting decision by the Electricity Supply Board, in connexion with Battery Eliminators, has just been made. According to information received, battery and d.c. mains-operated radio receivers are being converted to a.c. mains operation by the above-mentioned Board, free of charge to the user who has only to bear the expense of fitting. In Cork alone a considerable number of applications for conversion from listeners are already being dealt with, and that promptly, by a representative specially sent to that city. ITALY.—The Italian Ministry of Communications has just decided to lay a new submarine cable between Sardinia and the mainland. The cable is to provide means for both telephony and for high-speed telegraphy, the latter with certain limitations as regards speed. *The Electrical Review* states that the power of the Genoa wireless transmitter is to be increased to 10 kw. this month, while the power of Bozen is to be six times multiplied by the end of October. The Italian Ministry of Transport and the broadcasting authorities after consultation have decided to have a new transmitter erected in Milan, with a power of 50 to 60 kw., ready for service by next March. Florence is to have a 20 kw. transmitter by October of the present year, and Bari, according to the plan, will have an entirely new station of 20 kw. power by about the middle of April, 1932.

JAPAN.—The following particulars regarding the present condition of broadcasting in Japan on the authority of *World Radio*, should prove interesting. The Japanese Broadcasting Corporation (Nippon Hoso, Kyokai), the Tokio, Osaka, and Nagoya undertakings having been taken over by the Government in 1925, are administered by a board of directors re-elected every two years. It is not, however, revealed who constitute the electors, but the headquarters are at Tokio, and the country is divided into seven areas. The total number of listeners for the three stations mentioned above was 662,591 in February last. The conditions for licensing are that each listener must register at the Bureau of Communications, the registration being 2 sh., plus a monthly subscription of 2 s. The penalty for attempting to shirk these two simple obligations, is—ponder over it, gentle reader!—a fine of 2,000 shillings and/or imprisonment! NORTHERN IRELAND.—It is understood that the B.B.C. is to proceed with plans for replacing the Belfast station by a new and more powerful Northern Ireland regional station.

NEW ZEALAND.—Despite the general world-wide trade depression, the Dominion wireless licence figures continue to grow. They have, according to the latest reports, now reached a total of 63,293 licence holders, and, adds a reliable source of information, "with the increased revenue provided, the standard of service is being steadily improved." PERSIA.—Direct telegraph communication has been established between Iraq and Persia. Telegrams formerly went via India.

RUSSIA.—The *Morning Post* conveys the information that foreign ships in Russian waters are in future forbidden to use wireless communication without permission from the Soviet. In fact the only occasions, so it would appear, upon which a foreign

ship may use her wireless apparatus without permission will be either when she is in need of assistance for herself or is answering an S.O.S. from another ship.

SCOTLAND.—A new signalling radio beacon has been installed on May Island in the Firth of Forth. During fog the set will transmit a beam once every four minutes on a wavelength of 1,000 metres at a rated power of three kilowatts. The radius of the beam's signal is given as about 30 miles.

SOUTH AFRICA.—Amongst the items of expenditure in loan estimates for the current year are £585,000 for telegraphy and telephony. SOUTH AMERICA.—A special service for speeding-up cablegrams between London and important centres in Argentina and Brazil has recently been put into operation. It is stated that this has been introduced by I.J.T. Ltd. in conjunction with its associated company in South America, the Western Telegraph Co. It is asserted that although no extra charge is made for this direct service over a distance of 7,500 miles, "telegrams can, for example, be delivered in London in from one minute to a minute-and-a-half." "Which performance," says *The Electrical Review*, "is made possible by elaborate telephone arrangements at the transmitting and receiving stations." This is, of course, quite possible with "clear the line" conditions, but it would be equally interesting to know the average transit-time!

SPAIN.—The Madrid agency of Reuter informs us that the telegraph tolls between Spain and Tangier have been reduced by 50%.

U.S.A.—The U.S. Government Wireless Commission reports that wireless is coming into general use as an aid to the police in many States and cities. More than 60 cities already possess, or are constructing, systems which place headquarters in communication with patrol cars. Reuter's Trade Service of New York gives the following information regarding the use of combined radio and sound signals in the U.S.A. to permit navigators to calculate their distance from definite objects, even in fog, and without a special radio compass. It is stated that such a system has been successfully operated along the Atlantic Coast and the Great Lakes, and is shortly to be tested out on the Pacific. The spot chosen for the latter initial experiment is Blunt Reef lightship, near Cape Mendocino, California. *A Radio Hotel*!—The Waldorf Astoria Hotel, New York, has one of the largest radio receiving installations in the world, so it is said. In each of the 2,000 rooms one can listen to any of six programmes by turning a switch. Radio "fans" are catered for by 150 rooms, each of which is fitted with a set connected to a common aerial above the hotel at a height of nearly 600 feet. No mention is made as to whether all or any of these 150 rooms are sound-proof! *Important Radio Decision*.—Reuter's Washington agency reports that the United States Supreme Court has held that the Langmuir radio valve patent is invalid, thus reversing the decision of the Lower Court. The finding sustains the contention of the plaintiffs, the De Forest Radio Co., as against the American General Electric Co., that the Langmuir patent had not been infringed by them.

YUGO-SLAVIA.—The following information culled from the *Manchester Guardian Commercial*, and furnished to the latter periodical by Dr. Milan Stojadinovich, a well-known writer and radioist of Belgrade, should prove of considerable interest to many readers of the *T. and T.*, as it practically gives the radio history of the none too well-known country of Yugo-Slavia in the minimum number of words:—"Yugo-Slavia's first station was erected in 1926 at Zagreb, and had a power of half a kilowatt. Ljubljana followed in 1928 with a 2½-kw. set, but Belgrade, the capital, did not start its activities until the end of March, 1929, with modern Marconi 2.8 kw. equipment. These three stations are at present the only ones operating, and there are about 42,000 subscribers; 27,000 are served by Belgrade, and 8,000 and 7,000 respectively by Zagreb and Ljubljana." For those financially interested, it may be added that there is not much production of wireless equipment in the country at present, but there is an increasing demand for sets at the rate of two to three thousand customers.

Work and Amusement.—"No good purpose is served in our day by sighing for the good old times, when men would work from morning to night all the year round with only one day off. The more efficient organisation of work has, for large numbers, killed the possibility of pleasure in it. . . . It is foolish, as well as unjust, to complain that a mechanised and hard-driven generation should demand more diversion than the leisurely past."—*Daily Press*.

J. J. T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at April 30, 1931, was 1,985,759, representing a net increase of 3,588 on the total at the end of the previous month.

The growth for the month of April is summarised below:—

Telephone Stations—	London.	Provinces.
Total at April 30, 1931	714,213	1,271,546
Net increase	1,720	1,868
Residence Rate Subscribers—		
Total	182,452	283,648
Net increase	663	852
Call Office Stations (including Kiosks)—		
Total	6,966	27,957
Net increase	94	211
Kiosks—		
Total	2,337	8,134
Net increase	36	180
Rural Party Line Stations—		
Total	—	9,058
Rural Railway Stations connected with Exchange System—		
Total	17	1,970
Net increase	—	13

The total number of inland trunk calls dealt with in February, 1931 (the latest statistics available) was 8,942,477, representing an increase of 304,114, or 3.5% on the February, 1930, total. Outgoing international calls numbered 44,100 and incoming international calls 47,360, as compared with 43,241 and 46,971 in February, 1930.

Further progress was made during the month of May with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Ewell, Leytonstone (automatic).

PROVINCES—Eccles, Llanishen, Prestbury (automatic); Abernethy (Edinburgh), Arlesey (Hitchin), Balmore (Glasgow), Birtsmorton (Tewkesbury), Guyhirn (Wisbech), Garelochhead (Helensburgh), Haughley (Stowmarket), Ipstones (Cheadle, Staffs), Lydbrook (Cinderford), Pirton (Hitchin), Ringford (Kirkcudbright), Staveley (Chesterfield), Stenigot (Louth), Smallwood (Sandbach), Yapton (Littlehampton) (all rural automatic);

and among the more important exchanges extended were:—

PROVINCES—Burgess Hill, Norton-on-Tees, Preston (automatic).

During the month the following additions to the main underground system were completed and brought into use:—

Dover—Folkestone,
Bristol—Frome—Warminster,
Leeds—Wakefield,

while 71 new overhead trunk circuits were completed, and 74 additional circuits were provided by means of spare wires in underground cables.

TELEPHONE CHARGES.

A CORRESPONDENT in the *Daily Telegraph* recently put forward the suggestion that there should be a uniform charge for all telephone calls, irrespective of distance, and further indicated that in his opinion this charge should be 1d., though it is true he provided for 'express calls' at 6d., and 'urgent calls' at 1s. each. Apparently he contemplated the maintenance of an annual rental charge in addition, as at present. He based his proposal on the analogy of the postal and telegraph services, and propounded the view that once 'trunk' and 'toll' cables are laid, the exchanges established and the current supplied, the capital expenditure and overhead charges remain the same, however many or few calls are made, so that a uniform charge is reasonable.

Somewhat kindred suggestions are frequently made to the effect that telephone service should be given on the lines of the broadcasting service, the underlying idea being that but for defective business abilities on the part of the Postmaster-General and his staff, telephone service could be given, with unlimited calls, for something like 10s. a year.

The inherent unsoundness of such analogies as the postal, telegraph and broadcasting services is obvious to those who give any thought to the subject, and most of the readers of this journal will need little convincing on the point. The analogies are, however, so superficially appropriate, that it is perhaps worth while setting out as simply as possible, for the benefit of the non-technical reader, the fallacies underlying suggestions such as those mentioned.

FEATURES OF POSTAL AND TELEGRAPH COSTS.

A letter or a telegram requires no individual service at the originating point, being normally conveyed by the sender to one of a limited number of collecting places. From those collecting places it is passed on as quickly as possible to a central point, whence it can be forwarded with all the advantages of centralised machinery to the similar central point nearest to its destination. A letter from London to Aberdeen travels the greater part of its journey in a bag with thousands of other letters, the proportion of transport cost which it individually has to bear being extremely small. Similarly, a telegram from London to Aberdeen is signalled by an instrument which disposes of anything up to a hundred messages per hour, so that it utilises only a small part of the cable capacity of the route. It is only when the letter or telegram reaches the end of its journey that the question of individual service comes in; and as the individual service given at that point is normally a service by postman or messenger, it involves no appreciable capital expenditure other than the building in which the postman or messenger is housed.

The broadcasting service is similar in requiring no capital charges exclusive to the individual user, other than are involved in the initial provision of a wireless set; and even these charges are borne by the purchaser of the set, and not by the broadcasting company. All the programmes come to the owner of the set in bulk over the ether, and he merely has to 'plug in.'

Incidentally, it may be observed that the same thing applies in large measure to an electricity or gas service, where the capital cost exclusive to the individual user is confined to the cost of wiring his house and connecting it to the street mains outside his gate, whence he can then without further ado draw on the common or bulk supply. Here, again, the capital cost is usually borne by the user, and not by the supply company.

HOW THE TELEPHONE SERVICE DIFFERS.

The telephone service is on a quite different footing, in that there is no 'bulk supply' which the user can tap. Not only does every subscriber need individual plant at his premises, but he also needs to have a pair of wires appropriated to his exclusive use, running the whole way from his premises to the exchange with which he is connected, no matter how distant it may be. Such lines are expensive to provide and to maintain, and care has to be taken

that sufficient spare lines are always available to supply any new subscriber who may apply for service. This involves a continual and careful balancing of the cost and inconvenience of frequent opening up of cables, against the cost of keeping line plant idle and unproductive of revenue, although bearing interest and depreciation charges. Similarly, at the exchange, each individual subscriber has to have his lines terminated on a particular section of switchboard; and not only on one switchboard, for they have to be "multiplied" over a large number of points in order that each one of possibly dozens or scores of telephone operators can plug in to that particular line without moving from her seat. The question of the provision of a sufficient but not excessive amount of spare plant to meet anticipated needs comes in here also, and there has to be a continual looking ahead and forecasting of probable growth to ensure that the apparatus will meet the requirements. Much of the internal equipment is of an intricate character and requires several months to manufacture, so that a sharp eye is necessary on any tendency toward unexpectedly quick growth; and if a building is getting nearly full, and a new building or an extension has to be faced, it is usually necessary to begin the preparations three or four years ahead.

LONG-DISTANCE SERVICES.

These are the considerations which affect local service. When long-distance service comes into the picture, there are still further considerations. Every three-minute call from, say, London to Aberdeen, means the exclusive reservation of over 500 miles of trunk circuit for something approaching five minutes on the average (allowing for connection and disconnection of the call); so that the number of calls which any one circuit can carry is very limited. The provision of long-distance lines is extremely costly, and there are, therefore, heavy charges in the shape of interest on capital outlay as well as in the shape of depreciation. To suggest, as did the correspondent referred to at the beginning of this article, that the existing trunk lines could bear some enormous increase of traffic without further expenditure or costs is (to put it mildly) to ignore the facts of the position; and the suggestion that calls at the rate of 1d. each over such routes could be made to pay is open to still greater criticism. It would be as reasonable to say that, because there exist certain railway lines from London to Aberdeen, a satisfactory and remunerative railway service could be provided between these two places at 1d., 6d., or 1s. per passenger. Pooling the charges for local and long-distance calls would ruin the telephone service, either by making trunk calls uneconomically cheap or by making local calls prohibitively dear.

The above considerations explain why it is that all over the world the telephone service is essentially a more expensive service than postal or broadcasting services; and they further indicate that a large amount of money is expended in serving each individual subscriber even if he never makes a call at all. The British telephone service does not set out to make large profits, it being the practice, whenever the financial position allows, to pass on the benefit to subscribers in the shape of reduced charges; but it can hardly be gainsaid that the service must at any rate recoup itself for its total expenditure in providing service. In this cost there must be included the interest on capital expenditure which has been provided by loans, and provision for the heavy depreciation charges involved on telephone plant, as well as the cost of day-to-day maintenance of plant and the operation of calls.

WHAT IS THE FAIREST METHOD OF CHARGING?

There are various ways in which the charges necessary to cover the costs might be assessed. It would be possible, for instance, to fix a flat rate rental which would cover the whole cost and to make no separate charge for calls. Such an arrangement has been in force at various times and in various countries (though for the reasons already given, the term 'calls' in this connexion has to mean 'local calls,' as it would be out of the question to include trunk calls in a single tariff). But its effect is to make the small user subsidise the large user. The person who makes 50 calls pays the same as the one who makes 5,000.

Another possibility which is frequently advocated is to charge no rental but to recoup the whole cost of the service from the charge for calls. The effect of this course would be to increase enormously the number of subscribers whose use of their lines would be so small that the few shillings revenue annually would be far from covering the heavy charges involved in providing the service. The loss on such lines would have to be made up by the larger users, so that in effect the large user would under this scheme subsidise the small user.

The method adopted by the British Post Office since 1920 has been the intermediate one of charging each user as nearly as possible the cost of the service actually given. For this purpose the cost is divided roughly into (a) the cost of provision and maintenance of plant provided for the individual subscriber and (b) the cost of maintaining jointly-used plant, of operating calls, and of other miscellaneous items. The fixed rental charges are assessed at a figure which covers roughly the average cost per subscriber under (a) within a two-mile radius of the exchange (for the portion of lines beyond that radius an extra mileage charge is made); and they are the same for each subscriber's line (within two miles), except that as a special concession residential lines are allowed a rebate. The charges for local calls are fixed at a rate which covers the costs under (b), and their total for any individual subscriber varies proportionately with the extent to which he uses the service. The long-distance charges are similarly calculated in such a way that each subscriber pays approximately for the actual use he makes of the trunk and toll lines.

So far as speed of service is concerned the British telephone administration proceeds on the assumption that, as a rule, when a subscriber makes a call he desires it to be completed at once, and that it is unsound to grade calls as 'ordinary,' 'express,' 'urgent,' &c. Practically all short-distance calls, as well as many long-distance calls, are now put through on demand; and the aim is to extend this treatment to all long-distance calls at as early a date as possible.

There is little doubt that if either of the previously mentioned schemes of calculating telephone charges were now in force, the existing method would be the one which our prophets and reformers would be hailing as the ideal system. They would be extolling its simplicity, its beauty, and the fairness of its incidence. But as it is the existing scheme, all its virtues are kept in the background; the satisfaction which it gives to hundreds of thousands of subscribers is ignored, and the occasional human and mechanical failures which are inseparable from a vast organisation like the telephone system are emphasised and distorted out of all true proportion.

REVIEWS.

"High Frequency Alternating Currents." By K. McIlwain and J. G. Brainerd. London: Chapman & Hall, Ltd. 510 pp. Price 30s.

This book is intended for the use of senior or first year graduate students in electrical engineering. A knowledge of the differential and integral calculus is assumed and in addition the reader should have an acquaintance of the theory of alternating currents, including the use of complex numbers.

The greater portion of the subject matter, as the authors are careful to point out, is not original, but on the other hand there is combined in this one volume a complete course on high frequency alternating currents in logical sequence which in the ordinary way would only be obtainable by judicious selection from a variety of sources.

Roughly, the book can be divided into six sections dealing respectively with circuits, valves, filters, lines, waves and electro-mechanical systems, and it covers a ground which is not covered by any other single work at the present time.

Its value is enhanced by the bibliographies and questions which are provided throughout the work.

The authors make an error on page 389 in confusing the multiple tuned antenna with the Beverage wave antenna. These are two distinct types, the former is normally used for transmitting and the latter normally for receiving.

The multiple tuned antenna has advantages in a reduced earth resistance due to the number of tuning circuits in parallel, its radiating properties depend on its height and it is tuned to a definite wavelength. The Beverage wave antenna, on the other hand, is not suited for transmission except in special circumstances, its radiating properties depend on its length and not on its height above the ground, while it is not tuned to any definite wavelength.

Apart from this point the book appears to be a very reliable work and can be confidently recommended to the attention of telephone and radio engineers as well as to students.

"Communication Networks, Vol. I. The Classical Theory of Lumped Constant Networks." By Ernst A. Guillemin, Ph.D. London: Chapman & Hall, Ltd. 425 pp. Price 25s. net.

The study of electrical networks is a subject which has received increasing attention in recent years. Such networks can be roughly divided into two classes, namely, those in which the electrical constants are concentrated and exist as independent items, such as in wave filters and in the circuits of radio transmitters and receivers, and, secondly, those networks in which the constants are distributed throughout the circuit as in transmission lines. The question of whether a network can be regarded as having lumped or concentrated constants is, of course, purely a question of the frequency of the electrical currents passing in the circuit, since every piece of electrical apparatus has capacity, inductance and resistance and their relative importance is determined by the frequency.

In the present work the author deals only with networks with lumped constants, and a second volume to be published later in the year will deal with the classical theory of lines, cables and filters.

Filters are actually networks with lumped constants, but the theory of their behaviour can be derived by an extension of the theory of lines, and this probably explains their omission from the present volume.

All works dealing with this subject must necessarily be of a mathematical character, since the analysis of such circuits cannot be resolved without recourse to higher mathematics. The present volume is no exception, but the author shows by means of numerous worked-out examples how the formulae which he derives can be applied to computations of actual circuits, and a number of numerical problems are given at the end of each chapter so that the earnest student can test his knowledge. These would have been still more useful if the answers had been furnished.


There is another feature of this work which makes it much more readable than many of its class, and this is the explanatory letterpress in which the author in a particularly careful and helpful manner anticipates many of the difficulties which are liable to beset the reader.

In the absence of the completing volume it is rather difficult to criticise the work, but, nevertheless, it can be stated the subject has been handled in an exhaustive and masterly manner, and the methods of dealing with some of the more elusive aspects, such as, for example, the subject of transients in networks are particularly illuminating.

A useful section deals with the application of the generalised methods to particular problems such as the steady state solution of the transformer problem and the steady state characteristics of tuned coupled circuits.

The work is a most important and welcome contribution to the subject of communication engineering and can be studied with advantage by those confronted with network problems.

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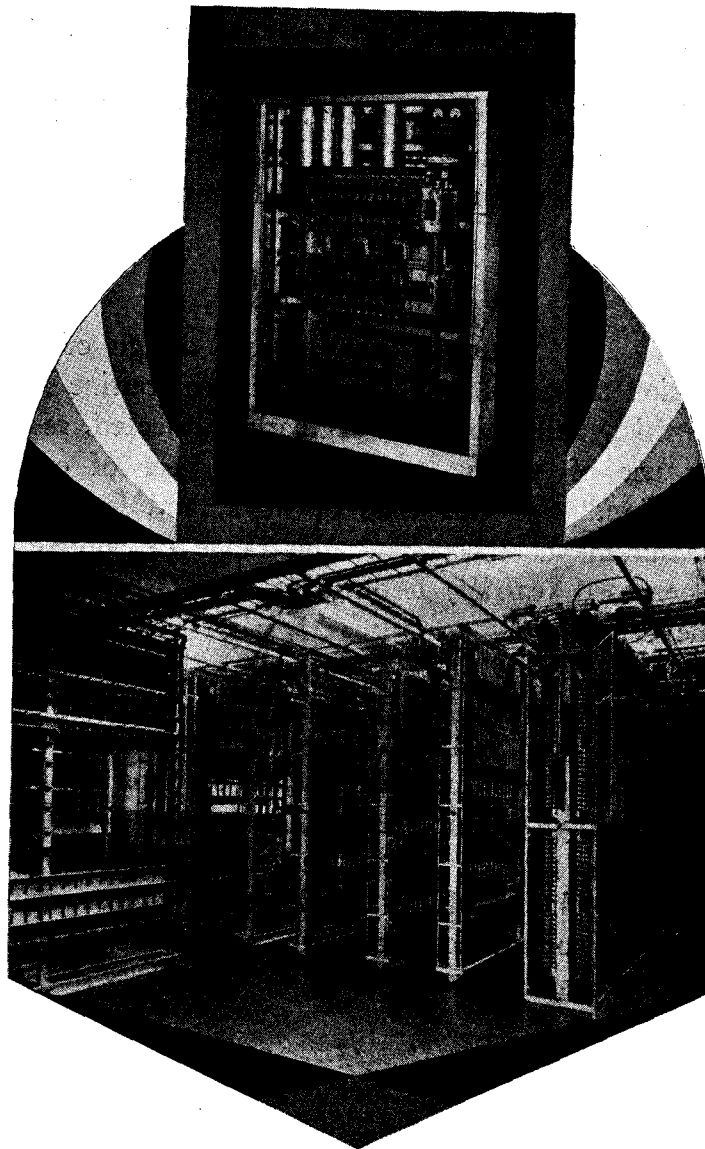
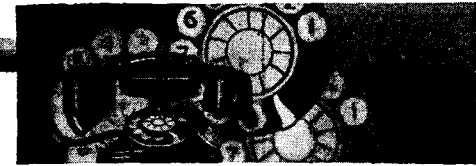
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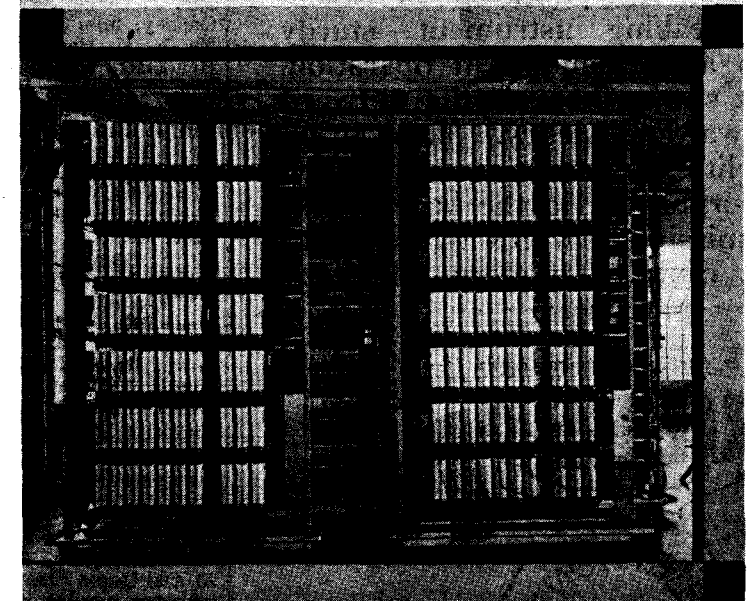
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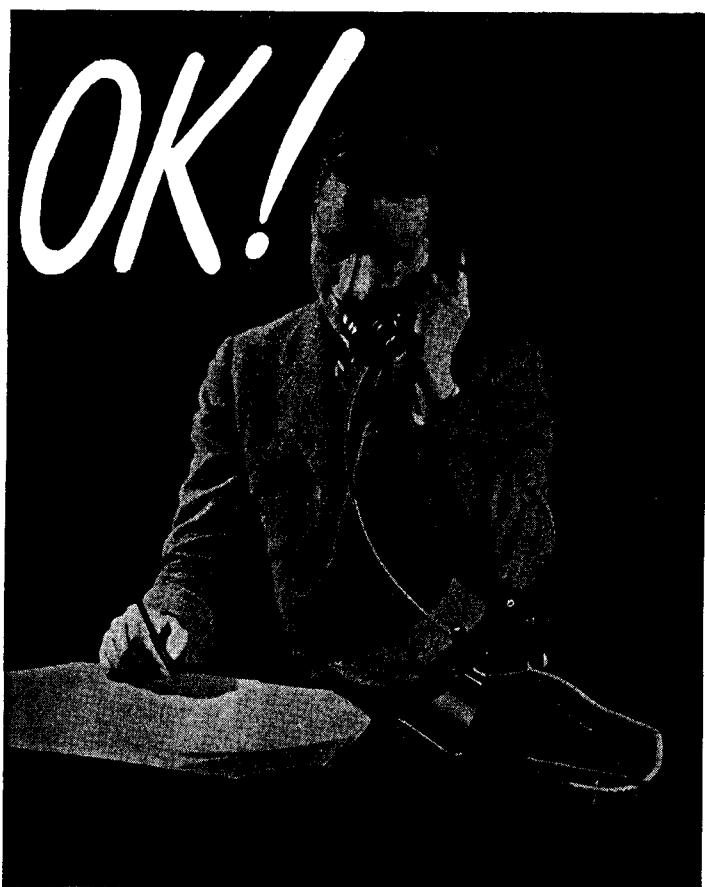
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KEW GARDENS AGAIN!

THE Retired Officers of the C.T.O. were well represented at the annual *rendezvous* outside the Palm House of Kew Gardens on June 10 last, and subsequently at the Imperial Restaurant, where due provision had been made for the inclement weather which had more than threatened the meeting in the earlier part of the afternoon but fortunately relented and ensured comfortable journeys homeward for all concerned.

Congratulations are more than a mere formality to the continued assiduousness of the esteemed leaders and organisers in the persons of Messrs. C. S. Keen and H. E. Adams.

Mr. J. S. Bailey, I.S.O., an unfailing attendant, took the chair and had a none too arduous task, where speeches were few and brief and discipline unnecessary! Mr. W. S. Fisher, bearing his fourscore and four years as well and even more lightly than many, a decade and more his junior, was a happy picture, while the presences of Mr. H. Bolton and Mr. H. J. Broughton were especially welcomed as a sign of renewed health. The absence from this annual function, for the first time, of Miss E. Moore, due to ill-health, was a much-regretted shadow, observed by many, certainly not least by her old friend Miss Jenny Watts.

The names of those who sat down to the excellent 5 o'clock are as follow:—

Mr. and Mrs. H. E. Adams, Mr. T. J. Allison, Mrs. W. H. Ampleford, Mr. J. R. Allwright, Miss S. M. Ashdown, Mr. B. G. Askew, Mr. J. Bailey, I.S.O., Miss E. A. Barker, Miss M. Barnfield, Mrs. H. E. Bath, Mr. and Mrs. F. J. and Miss Batho, Mr. W. A. Batten, Mrs. L. Beadle, Mr. N. E. P. Bell, Mr. G. T. Bennett, Mr. J. R. Berry, Mr. A. C. Bing, Mr. H. A. Bolton, Miss A. E. Booth, Mr. S. Boshell, Mr. and Mrs. A. E. Bowden, Mr. and Mrs. H. J. Broughton, Miss F. J. Brown, Mr. F. W. Butler, Miss J. E. Cameron, Miss L. Carr, Mr. D. E. Cartwright, Capt. A. J. Cherry, M.C., Mr. and Mrs. E. J. Clapp, Miss E. I. Clarke, Mr. E. J. Clarke, Mr. H. Clarke, Mr. J. H. G. Clifton, Mr. A. J. Condy, Miss A. E. Cooke, Miss F. M. Cooke, Mr. G. A. Costello, Mrs. Cox, Mr. and Mrs. E. Crook, Miss T. E. Dingley, Mr. and Mrs. J. Doust, Miss E. F. Duncan, Mr. J. W. C. Duncan, Mr. C. Elphick, Mr. H. T. Elvey, Mr. H. W. Evans, Miss A. M. Finch, Mr. W. S. Fisher, Mr. F. W. and Miss Fryatt, Mr. F. J. Furby, Mr. and Mrs. R. A. Furness, Mr. A. T. Good, Mr. F. Goldsack, Mr. J. G. Goldsack, Mr. and Mrs. J. Gough, Mr. and Mrs. E. C. Govier, Miss A. E. Gower, Miss M. Grealey, Miss A. H. Grimmette, Mr. T. W. Gunter, Miss E. Hampson, Mr. R. M. Hampson, Mr. F. W. Harrison, Mr. H. Hayman, Miss G. M. Henderson, Mr. C. Heywood, Miss G. A. Hicks, Mr. E. L. Hilton, Mr. and Mrs. E. Hopkins, Miss C. E. Horlock, Miss A. M. Hutt, Miss E. M. Ireson, Miss L. Jolly, Mr. D. W. Jones, Mr. W. E. Jones, Mr. and Mrs. C. S. Keen, Mrs. F. Keen, Mr. R. E. Kemp, Mr. and Mrs. P. J. King, Mr. A. E. Kings, Mr. G. F. Lange, Miss F. A. Le Pla, Mr. E. Lewis, Mr. C. R. Lowe, Mr. A. W. F. Ludlow, Mrs. A. C. MacEwan, Mr. and Mrs. G. H. Major, Mr. and Mrs. A. W. Malein, Mr. G. J. Mannors, Miss E. C. Mayersbach, Mr. C. J. Minors, Mr. F. Morgan, Mr. F. J. Muller, Mr. G. W. E. Murdoch, Miss E. L. Nottidge, Mr. S. F. Pace, Mr. P. S. Padfield, Mr. H. and Miss Parker, Mr. and Mrs. W. Payne, Mr. S. Pearce, Mr. and Mrs. H. W. Pendry, Mr. E. F. Poole, Mr. L. W. Powell, Mr. J. Rees, Miss D. Riminton, Mrs. C. Ritty, Mr. L. C. R. Rowan, Mr. T. Sadler, Mr. and Mrs. J. E. Sayers, Mr. F. Seager, Miss A. A. Shacklock, Mr. S. T. Shapecott, Mr. and Mrs. R. S. Shoyer, Mr. S. J. Smith, Mr. C. W. Sparkes, Miss L. Strachan, Mr. and Mrs. F. J. Taylor, Mr. W. J. Town, Mr. S. Trott, Miss L. Trundle, Mr. W. Turner, Mr. F. W. Turpin, Miss F. A. Tyler, Mr. J. J. Tyrrell, Mr. E. Veale, Mr. E. A. Ward, Miss F. J. Watts, Miss E. A. Wheeler, Mr. F. J. White, Mr. J. Whittingham, Miss E. M. Willis, Mr. H. F. Winder, Mr. C. W. Winn and Miss E. R. Wright.

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J. J. T.

THE CHARACTERISTICS OF RADIO COMMUNICATION.*

By A. J. GILL.

A NUMBER of papers have been given before this society from time to time on the radio activities of the Post Office, but in most cases these papers have dealt with specific applications of radio-telegraphy or telephony and not on the subject of radio transmission generally. It is the object of the present paper to attempt to give a brief outline of the characteristics of radio communication and its possible scope and limitations.

The answer to the question as to whether a certain service should be carried out by radio usually depends on economic considerations, although, of course, there are a number of services where radio is the only possible method of communication. For the purpose of communication between moving station and moving station or between moving stations and land stations radio is the only possible method. For some other services, such as long distance telephony and broadcasting, radio is often the only practicable method. For example, although it might be possible to provide a telephone service to Australia by land and submarine cables, the cost would be prohibitive. In the same way the provision of a broadcasting service to a large area with a scattered population is only economically practicable by means of radio, although in the case of a densely populated area it is quite practicable to provide a satisfactory broadcasting service by line connexions, and, indeed, some development in this direction is actually in progress.

For the benefit of those who may not be very familiar with the subject I propose to give a brief outline of the general principles of radio communication, and then to proceed to discuss a few of the problems which arise in the practical applications of these principles. The velocity with which an electric wave travels through space is 300 million metres a second—in other words, about 186,000 miles a second. This velocity is the same as that of light, and the difference between light waves and radio waves is merely one of wavelength, for whereas visible light has a wavelength of the order of a twenty-thousandth of an inch, radio waves are of the order of from a few inches to 12 miles in length.

Radio waves are produced by energising an elevated conductor with high frequency alternating currents—some of the energy supplied to the aerial or conductor is dissipated into space, and this energy constitutes the radiation from the aerial.

For example, suppose we supply an aerial with a current alternating a million times a second. One second after commencement the radiation will have travelled 300 million metres, and in this distance there will be spaced one million pulses of energy of similar sign all travelling outward. The distance between adjacent pulses will obviously be 300 metres, and this distance we call the wavelength of the radiation. On the other hand, if we energise the aerial with an alternating current of lower frequency, say 15,000 a second, although the radiation travels at the same velocity as before yet the pulses of energy will be fewer and consequently more widely spaced. In this latter case the distance between each pulse will be 20,000 metres. Thus we see that long wave is synonymous with low frequency and short wave with high frequency. Both sets of terms are in everyday use, but because in electrical computations frequency is the term ordinarily used and also because we can measure frequency with a greater precision than wavelength, there is an increasing tendency to specify electric waves by their frequency.

Waves used for radio communication are divided into the following categories:—

- (1) Low frequencies, below 100 kc., or long waves, above 3,000 metres.
- (2) Medium frequencies, between 100 kc. and 1,500 kc., or medium waves, 3,000 to 200 metres.
- (3) Medium high frequencies, 1,500 to 6,000 kc., or intermediate waves, 200 to 50 metres.
- (4) High frequencies, 6,000 to 30,000 kc., or short waves, 50 to 10 metres.
- (5) Very high frequencies, above 30,000 kc., or very short waves, below 10 metres.

Radio waves normally proceed in a straight line away from their point of origin. If they encounter an opaque object, such as a hill of conductive material, this object casts a shadow, but as we get further and further behind and away from the obstruction the radio field begins to appear again until at a great distance the effect of the obstruction disappears.

This effect is a function of wavelength, and the shadow due to a conductive obstruction is much more marked with the shorter waves than with the longer waves.

In transmitting over long distances the curvature of the earth itself presents an obstruction, and in the early days of radio-telegraphy many doubts were expressed as to whether it would be possible to signal over great distances because of this. Marconi showed such transmission to be possible in his historic experiments between Poldhu and Newfoundland in 1901.

The explanation of this effect is that the wave is confined in its transit by the underside of a conducting layer in the upper atmosphere. This layer is known as the Heaviside layer, as its presence was first suggested by Oliver Heaviside. Many measurements have been made of the height of the layer. One method is to send a signal of very short duration from a transmitting aerial and to record this signal at a receiving station about 8 or 10 miles away on a high speed recorder such as an oscillograph. The record shows, first, the arrival of the direct wave and shortly afterwards the arrival of a second wave which has travelled up to the Heaviside layer and been reflected back to earth. The delay between the arrival of these signals indicates the additional length of the indirect path. Sometimes as many as three indirect signals have been received suggesting the presence of separate layers at heights of the order of 70, 140 and 280 miles. Often the records show one layer at heights varying from 60 to 300 miles above the earth.

The effect of the layer in the case of the longer waves is that the wave apparently travels with its feet on the earth and its head in the layer. In the case of the medium and shorter waves the wave appears to split, and while one portion travels along the earth other portions leave the earth and travel upwards to the Heaviside layer, from whence they are reflected back to the earth. In these cases the direct wave and the reflected wave both arrive at the receiving station, and while sometimes this results in an augmentation of the received signals, at other times it results in a diminution of the received signal. As the length of path of the indirect ray varies with any change in the layer, these effects alternate from time to time, and we get the phenomenon of fading, with which all who have listened to foreign broadcasting stations will be familiar.

On the shorter waves the earth wave dies out very rapidly, and at distances beyond a few miles only the reflected waves remain. It frequently happens that owing to the manner in which the radiation is projected from the aerial and to other factors (such as the height of the layer), the reflected rays do not appear until a considerable distance has been reached beyond the point at which the earth wave or direct ray has disappeared. There is thus a space in which no signals are heard, and on proceeding beyond it signals are again received. This dead space is sometimes referred to as the "skip distance."

Where the received signal is wholly due to the indirect ray, fading in varying degrees is usually present, pointing to the fact that the signal is the summation of several rays having different lengths of path.

It is a curious fact that while the weakening or attenuation of the earth wave is least on the longer wavelengths and becomes greater and greater as the wavelength is decreased, yet in the case of the reflected wave exactly the opposite effect obtains, and as we get to shorter and shorter waves, down to a limit of about 10 metres, the reflected waves are capable of travelling greater and greater distances. In fact, short-wave signals often travel several times round the world and register a signal at the receiving station each time they pass, so that they seriously embarrass reception. As a radio signal passes round the world in about 1/7th of a second, the tape records from a radio receiver at such times show the direct signal followed by a second signal 1/7th of a second later, and sometimes a third 1/7th of a second after the second signal. A further complication sometimes occurs when signals pass round the world in the opposite direction and add their record to the tape.

These multiple signals are usually referred to as echoes, and the methods adopted to render them innocuous will be dealt with later.

Before leaving the subject of echoes, however, I should like to mention another type of echo which is quite distinct from the type referred to previously. These echoes are usually called long delay echoes and are of very rare occurrence, so rare, in fact, that they do not cause trouble in radio reception. The curious fact about these echoes is that they are heard a comparatively long time after the signal, the period sometimes amounting to as much as 15 minutes. The more usual period of delay is about a minute. The puzzle is, "what is the path of these echoes?" A number of explanations have been suggested; one is that the waves penetrate a portion of the upper atmosphere, where the velocity of propagation is much reduced. The objection to this explanation is that although it is not impossible to conceive of such a medium, computations show that under such conditions the wave would be rapidly dissipated. Another explanation offered is that the waves penetrate to a space between two ionised layers and travel round the world a number of times before escaping. A third suggestion is that the waves are reflected from and propagated along bands of electrons distributed in the interplanetary space and are finally reflected back into the terrestrial system. These long delay echoes are so rarely encountered that it is difficult to obtain data about them and they are likely to remain a mystery for the present.

Returning to the subject of ordinary communication, it will be obvious that the transmission of a steady wave is insufficient for the purpose of communication.

At the receiving station an elevated conductor or aerial is used and the waves in their passage induce in this conductor alternating currents similar to those in the transmitting aerial but of lower magnitude. These currents are conveyed to the wireless receiver, which is a device for indicating the presence of the currents. In order to convey information it is necessary to vary the wave in some manner; this variation of the wave is called modulation. There are two simple ways in which a wave may be modulated; we can alter its magnitude and we can alter its frequency. The first method of modulation is the one commonly used, and is called amplitude modulation; the second type is known as frequency modulation and is sometimes unintentionally present in a wave due to imperfections of the transmitter.

* Paper read before the Telephone and Telegraph Society of London.

Amplitude modulation changes the contour or envelope of the train of waves, and the simplest type of modulation is that in which the envelope takes the shape of another wave, that is to say, when the original wave is modulated by another wave of lower frequency. In another type of amplitude modulation we suppress the wave altogether during certain periods. This is the method usually adopted in telegraph signalling: when the key is depressed at the sending station the wave is emitted and when the key is released the wave is no longer emitted. This type of signalling is known as continuous wave, or C.W., signalling, and is in common use on long-wave telegraph services. It is sometimes convenient to use both types, that is to say, when the key is depressed a modulated wave is emitted and when the key is released nothing is emitted. This type of signalling is referred to as modulated C.W., or tonic train, and is largely used for telegraph signalling on the medium and shorter waves.

In the case of radio telephony, it is necessary to modulate the wave not with a single tone but with all the tones utilised in the transmission of speech or music. For intelligible speech we require to transmit tones from about 400 cycles per second to about 3,000 cycles per second, and for music we should transmit tones of from 30 to 10,000 cycles per second.

The simplest type of radio telephone transmitter is one in which the microphone is inserted directly in the aerial circuit. The action of the sound waves varies the resistance of the microphone, which in turn absorbs more or less of the energy supplied to the aerial. On higher powered transmitters it is not possible or convenient to include the microphone in the aerial circuit and other methods are adopted, but the result is the same, the amplitude of the high-frequency emission rises and falls in conformity to the value of the speech currents applied to the modulating equipment of the transmitter. These modulated waves acting on a receiver produce a response depending on their amplitude. As the amplitude rises and falls so the current from the receiver rises and falls and when the wave has been modulated by speech currents the output from the receiver contains speech currents similar to those used to modulate the transmitter. It is possible to demonstrate by simple mathematics that if we have an alternating current of frequency, say, f_1 and we modulate this with another frequency, say, f_2 that the resulting current is equivalent to the sum of three unmodulated currents of frequencies $f_1 - f_2$, f_1 and $f_1 + f_2$. The frequency f_1 is known as the carrier frequency, while $f_1 - f_2$ and $f_1 + f_2$ are known as the lower and upper side frequencies respectively. In the transmission of music f_2 may have any value between 30 and 10,000 cycles per second, so that during a transmission the frequencies utilised comprise the band of from $f_1 - 10,000$ to $f_1 + 10,000$, that is a total band width of 20,000 cycles.

Since this is the case we should space the carrier frequencies f_1 of various stations at least 20,000 cycles apart so that the sidebands of adjacent stations do not overlap. It is impossible to do this in practice owing to the limited number of frequencies available, and in Europe it is the practice to place the carrier frequencies of broadcasting stations 9,000 cycles apart. There is a certain amount of interference, but this is relieved as far as possible by geographical spacing between stations using adjacent carriers.

In the case of a telegraph station working on C.W. with suppressed spacing the action of keying sets up sidebands. Take, for instance, a station sending dots at a speed of 100 words a minute—this is equivalent to a dot frequency of 40 per second. Now this is equivalent to a carrier modulated not by a pure frequency but by a square-topped wave. By mathematical analysis it can be shown that such a wave is equivalent to the sum of a number of frequencies which include the fundamental or dot frequency and the odd multiples of this frequency. Thus, in the present example, the square-topped wave is equivalent to the sum of frequencies of 40, 120, 200, 280, &c., cycles per second. As the higher frequencies rapidly decrease in amplitude it is usually sufficient to take account of the fundamental and third harmonic. Thus telegraph signalling at 100 words per minute is roughly equivalent to a carrier modulated by frequencies of 40 and 120 cycles per second. The total band width of the resulting emission will thus be about 240 cycles, and in actual practice this is about the spacing adopted between long wave telegraph stations. The fact that a definite band of waves are necessary for the transmission of intelligence sets a limit to the number of stations that can operate in a given area. For example, on the long wave band from 20,000 metres to 3,000 metres or in other words from 15,000 cycles to 100,000 cycles we have a band of 85,000 cycles. The total number of telegraph stations capable of working at 100 words per minute that could be placed in this band at, say, 250 cycles spacing, would be 340. A telephone station using a maximum modulation frequency of 3,000 cycles would occupy a total band of 6,000 cycles, that is to say, the same space as 24 telegraph stations. It is thus obvious that a telephone service makes a much more extravagant use of the ether than a telegraph station. An important development of recent years was the discovery that in a radio telephone it was not essential to transmit the carrier and both sidebands, and that provided the receiver was suitably equipped it was sufficient to transmit one sideband only. This has two important advantages: firstly, the band width utilised for a given service is halved, and secondly, the transmitter becomes much more efficient. In the ordinary radio-telephone transmitter the power radiated on the carrier greatly exceeds the power on the sidebands and this carrier power contributes nothing to the conveyance of intelligence. For example, on a fully modulated transmitter half the power is in the carrier and a quarter in each sideband, so that if one sideband and the carrier is suppressed we can put four times the power into the radiated sideband without increasing the power supplied to the transmitter. In addition, during quiescent intervals when the transmitter is not modulated the power normally used on the carrier is saved. This is an important point on a high power set, as the time the set is in use is generally only a small percentage of the time it has to be available.

The successful operation of this system requires very accurate frequency control at the transmitting and receiving stations, as it is necessary at the receiving station to supply a frequency to the received signal which must not differ by more than 5 to 10 cycles per second from the carrier frequency which has been suppressed in the transmitter. For the above reason it is only possible to operate this system on the long wavelengths, and even on these waves the constancy of frequency must be within one part in ten thousand.

The only service on which this single sideband suppressed carrier system is being used at the present time is the long-wave transatlantic telephone, which occupies a band of from 58,500 cycles to 61,500 cycles. In order to effect a still greater economy in waveband the British and American stations both use the same band. This requires the use of special voice-operated switching equipment at the points of connexion with the land telephone systems on each side to ensure that only one transmitting path is operative at a time.

Thus we see that the transmission of intelligence in any form requires the use not of a single frequency or wavelength but of a band of waves or frequencies, the width of the band depending on the class and type of transmission.

The transmitter and its aerial must be capable of radiating all the frequencies. At the receiving station the receiver must be capable of accepting all these frequencies and, if it is to be untroubled by other services, it must reject all other frequencies. The technique of receiver design has reached a high degree of perfection, and at the present time it is possible to build receivers which will accept a given band and ignore all frequencies outside it.

(To be continued.)

CORRESPONDENCE.

HELPLESS.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

YOUR contributor, "W. F. T." in the June issue, deploras the fact that very little help is afforded in the development of the telephone service by people engaged in the service and not directly responsible for such development.

A recent announcement in the P.O. Circular indicates that the manipulative or commercial staff of the Post Office are expected to take their share in the development of the telephone service. From my own experience I know that very few counter clerks have a good knowledge of the system or are interested in its development, some do not even know that information on telephones may be found in the P.O. Guide. Invariably every enquiry is referred to the District Manager or the address given to the Contract Officer. Counter officers have a great opportunity, not only in securing new stations and extensions, but of increasing the "calling rate." It is only a question of "salesmanship."

I will give a few examples. A subscriber wanted his telephone moved to a more convenient position. I suggested to him it would be better to have an extension. A telephone express letter was suggested to an inquirer as to the delivery of an express letter. I also interested an American, who was spending a lot of money on cables, in the Atlantic telephone service.

I agree that much good would be done by educating the Postal staff in the telephone system and the campaign for its development, so that all enquiries regarding telephones could be dealt with accurately.

Every member of the public is a potential subscriber or user of the telephone. It is a bad advertisement to hear people grumble about their service, accounts, and delay in installing new stations, and then be referred to the District Manager for a satisfactory answer.

"W. F. T." suggests some form of encouragement. It is very nice to have one's efforts appreciated. The only appreciation that has come my way came from a member of the public. A lady had taken a new house, the telephone wires were there. Could she have a telephone quickly as her brother was to undergo an operation? Close co-operation between myself and the Contract Officer enabled the service to be given in 2½ days. The lady was delighted as her husband told her the Post Office would take three weeks.

It is very remarkable, too, that when the system in this town was changed to automatic, no one in the Traffic Section thought the Postal staff would be interested in, or would require any information about, the new system.

I have not yet seen the new telephone leaflet for the information of the staff, but would suggest that a printed letter or leaflet is issued to counter officers, inviting them to make a special effort to assist in the development campaign. Talks or lectures could be given by the Traffic Section.

In order to make the public more telephone-minded, I suggest that "house telephones" in public offices be replaced by ordinary telephones where the system is automatic. Telephones for official use should be placed in the most suitable place, not near doors, or in a noisy environment. It is a bad advertisement to use the telephone with one ear covered up. An instrument of the new type should be prominently displayed on the counter of all head offices.

Although I always carry a supply of the Contract Officer's cards, I cannot persuade him to become a subscriber to the *Telegraph and Telephone Journal*, of which I am the local agent.

S. C. AND T.

LETTERS FROM A RETIRED CONTRACT MAN TO HIS SON.

(I.)

My dear Tom,—Your mother and I are very glad to hear that your application for a Contract Officer's job has been successful. It is a fine job, as I ought to know, particularly if you go all out to learn everything you can about the telephone system and its ramifications.

You ask me for advice as to the best methods you can adopt to become efficient. Well, laddie, it is not easy. However, here goes for a few pointers.

A canvasser is, more often than not, born and not made. You, I think, may have inherited some of your dad's abilities in that line, so that you start with a fundamental bias which should stand you in good stead.

Learn your job not only on the canvassing, but on the technical side as well. You want to know more about the system than the man you are talking to.

Be clean, neat and tidy in your person and clothes. Clean hands and linen will often gain you an interview which might otherwise be refused. Remember always that you represent a Government Department and are probably the only such representative than many of those you call upon have ever seen as such, and you may suffer for it.

Always be polite, no matter how aggravating your prospect may be. He reads the papers and unfortunately often fails to take an independent view, but slings some of the mud the papers manufacture, and it will be your business to correct wrong impressions. Act always so that you leave a friend behind you and endeavour to show adverse critics the error of their ways by good-natured argument.

Impress your personality on those you meet. What I mean is this, if you fail to bring off the order you are seeking, you should have so impressed your man that when he does decide he won't have forgotten you, but in writing in to the office will remember your visit and with luck your name, and mention it.

Don't mumble your piece when you come to say it. Speak out. Nothing annoys one more than to have to strain to catch what is being said. Good articulation has saved many a canvasser from having to leave a possible order behind.

When you get an order don't be so pleased with yourself that you forget to suggest an extension or other subsidiary apparatus.

Always be bright and cheerful, and if you get kicked out turn up again smiling when next you call. I remember a wild Irishman who was a Contract Officer, who called and pressed his case so hard that he was told to get out and go to H. . . l. He went, not to H. . . l, of course, but turned up next day smiling and with a cheery remark, "Well, Sir, I'm back from where you sent me," got his order. A canvasser's hide must be thick enough to turn off any unkind and ill-informed remarks which are thrown at him. Give a smile and you will, in ninety-nine cases in a hundred, receive a smile.

Keep your armour bright and never let the arguments with which you are equipped get rusty. Keep them up to date, and always be on the outlook for new ones. It is no use using a bow and arrows against modern machine guns.

Study people and things so that you can judge the type of arguments most likely to suit the particular person you are dealing with. With some people you can be more or less free and easy, but with others this would be fatal. One of the most difficult men I ever had to deal with—a grouser—always succumbed to a reasonable amount of chaff, but this would be highly dangerous unless you have learned to judge your man. A quiet, confident

attitude without any show of official red tape or bombast generally is acceptable. Undue familiarity should be avoided, as should also an attitude of extreme humbleness.

I should make every Contract Officer pass an examination in general knowledge so that he may be able to discuss in an intelligent manner all sorts of odd subjects in which his prospect may be interested. Art, gardening, fishing, books, wireless, or what not, but for goodness sake avoid politics and theology, for on those two thorny points many a canvasser has been impaled.

Be natural, avoid extremes of words or gestures.

Be enthusiastic about the article you are selling and try to instill into your *vis-à-vis* a little of that enthusiasm. A salesman who does not believe in himself and in the article he is selling had better seek another job.

Be patient. Everyone does not know as much about your job as you do, and to the public seeking advice you must act as guide, philosopher and friend and give the best possible advice always, even if occasionally it costs you a station to do so. In the long run you will gain.

Knowing you, I need not tell you to avoid "standing treat" in order to obtain business, and, conversely, never accept "treat" or anything else from a prospect.

When you find a man unreceptive as he is preoccupied with other matters, clear out, but call another time, when your luck may be in.

Never make promises without definitely knowing that they can be fulfilled.

If some question arises to which you do not know the answer say so, but add that you will find out and communicate the answer later, and never fail to do so.

Know your rates thoroughly and have the facts of the case ready before you see your prospect. Don't fumble with a mass of papers before him, but get to the point and stick to it. No-one expects you to know all the multifarious rules governing telephone service, but you must know the main ones and know how and where to get the others at short notice. Clear up any doubtful point in any papers handed to you to deal with before seeing your man. Don't be afraid to ask questions of your chief; he is there to help you and in case of necessity will gladly accompany you to see a customer. Two heads are sometimes better than one, and if an order results you will get the credit all right.

Be scrupulous about keeping appointments. Nothing annoys a would-be subscriber more than to be kept waiting beyond the appointed hour. If, as sometimes must be the case, you are delayed by a previous appointment, try to get into touch with the subscriber if he is already connected and in any case explain the cause of your delay when you see him.

Remember that you are one of the salesmen of a huge business with ramifications reaching far beyond the horizon of most people. You are selling telephone service, not a telephone, always remember that. In order to provide that service men and women are being employed in practically every trade that you can think of. Coal, iron, copper, tin, lead, and other metal miners and workers generally, brick makers and layers, pottery workers, builders, carpenters, cabinet makers, plumbers, cable makers, rubber growers and manufacturers, cotton, silk and other textile workers; but why go on, the name of those engaged in the industry is legion. There are, in addition, of course, the people who plan and put all these things together, and, finally, the men and women who, through their agency, provide the service. So you see you are a traveller seeking orders, every one of which gives so much work to many people. In these times of depression it is the bounden duty of every Contract Officer to do his bit to decrease that depression. You will, I know.

Finally, be loyal to the Department and your chiefs. You may get orders to do certain things which you consider futile or

trifling, but then you may not be aware of all the circumstances leading up to your instructions, although I believe that in order to get willing service and the best results from his staff, a chief of the right kind should always carry his staff with him and explain the why and the wherefore of anything out of the ordinary. I have felt the need of such enlightenment often myself. When you are out on your ground you are away from immediate supervision and on your honour to work just as well as if your chief was at your side. Play the game always.

See that all agreement forms you turn in are correct in every respect and that any forms or reports you make are legible and concise, while full enough to make the matter clear. Avoid wordiness, however, and you will obtain the blessings of those who have to read them.

I must stop now. Telly is sunning herself on the window sill and keeping half an eye on the sparrows who are dust bathing in my rose bed, and Fony is watching me anxiously, as he thinks it is about time I took him for his afternoon walk. *He* appreciates my retirement, if I don't. Mother sends her love, and I do, too, of course; and we both hope that you will be able to run down to see us at Whitsuntide. Take care of yourself.

Your affectionate Father,

THOS. E. L. SERVICE.

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

VII.

DESCRIBE the construction of the Post Office, Standard B, rectangular base, relay. Show clearly how continuity of the electrical circuits is secured.

A prize of a book will be awarded for the best answer, which should reach the Editor by July 31. The correct solution will appear in the September issue.

SOLUTION OF QUESTION V.

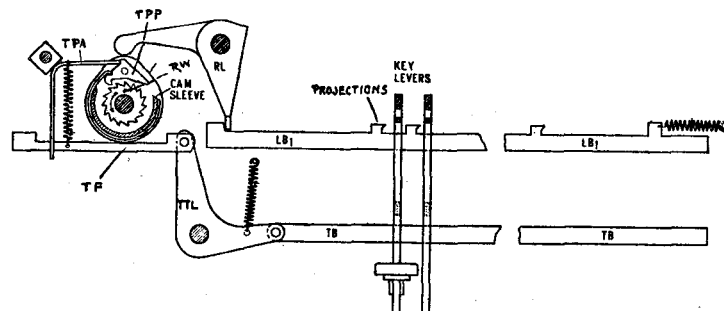
The teleprinter question was answered very creditably by a number of students, but the movement of the send-receive switch was frequently overlooked, and it was not made clear whether one or both pawls are engaged during the revolution of the cam sleeve.

The author of the paper considered to be the best has evidently had opportunity to study closely the recently issued technical instruction on the teleprinter. All movements involved are included, the nomenclature is correct, and irrelative points are avoided. The answer of Mr. R. Webster, P.O. Telegraphs, Perth, Scotland, with slight verbal alteration, is as follows:—

"The signalling currents required to transmit the letter 'R' are as follows: Start impulse, spacing. Code combination, spacing, marking, spacing, marking, spacing. Stop impulse, marking.

"When the keybar is depressed it enters between the projections of the five combination-bars, operates the trip-bar TB, and moves forward a locking-bar. The trip-bar operates the trip-link TTL, trip-finger TF, and the pawl abutment TPA. Two pawls TPP are released and engage with ratchet-wheels RW,

causing the cam-sleeve to rotate. The re-setting lever RL is also released and its lower end is drawn to the right by the tension of spiral springs acting upon the combination-bars. Combination-bars number 2 and 4 move to the right, thus releasing the relative

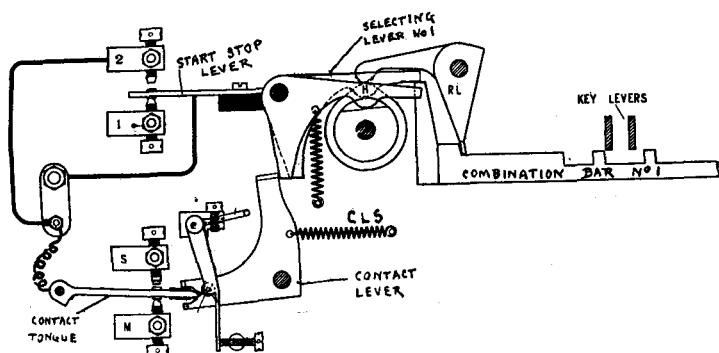


CAM-SLEEVE RELEASE MECHANISM

FIG. 1.

selecting levers; a locking-bar somewhat similar to a combination-bar LB1, also moves to the right and a projection on it moves into a hole in the key-bar and remains there until it is replaced just prior to the completion of one revolution of the cam-sleeve.

"As the cam-sleeve rotates it causes the horizontal portion of the start-stop lever to move upwards. The spring CLS pulls the forked end of the contact-lever CL in an upward direction, moving the contact-tongue from the marking to the spacing contact. The cam-sleeve continues its revolution but as selecting-lever No. 1 has not been released, the contact-tongue remains on the



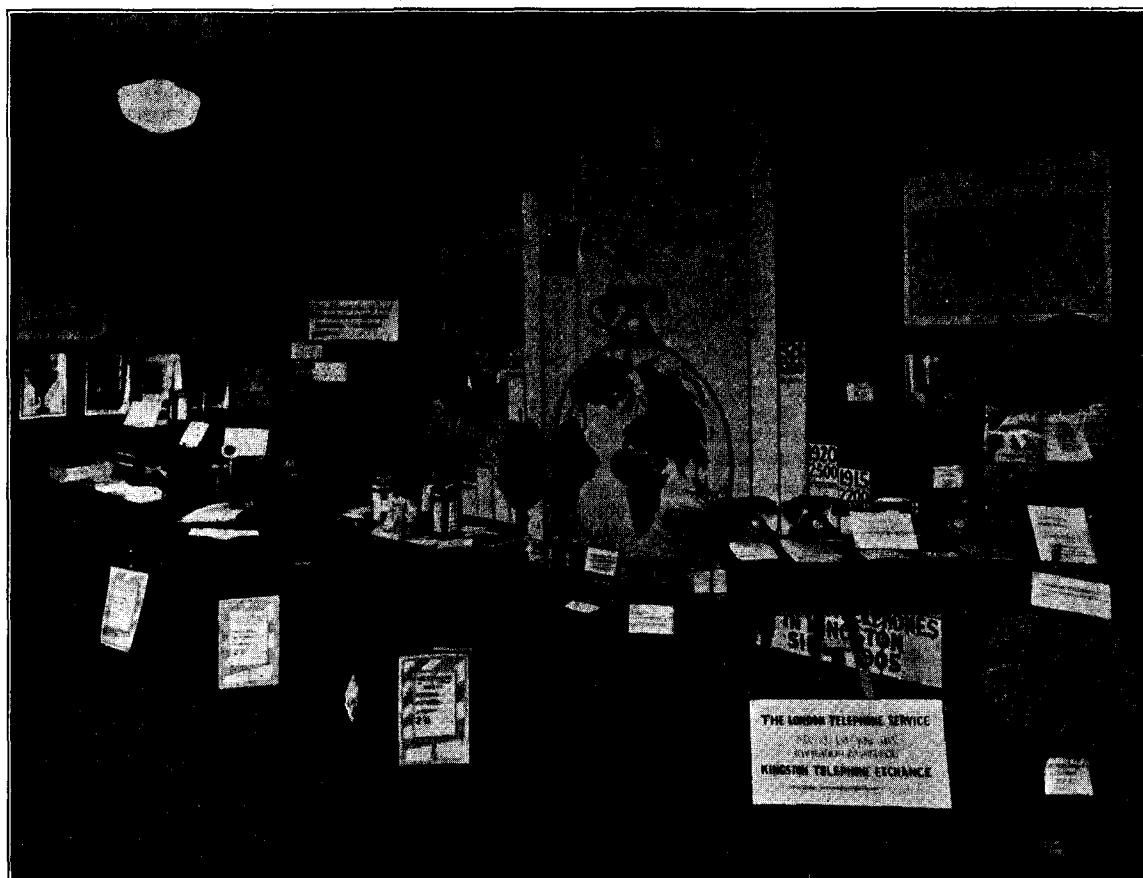
TRANSMITTING MECHANISM.

FIG. 2.

spacing side. Selecting-lever No. 2 is free to move and its lower end, acting upon the contact-lever, and contact-tongue, places the latter against the marking contact. Selecting-levers Nos. 3 and 5 act in the same manner as No. 1, whilst No. 4 acts similarly to No. 2. When the signal for selecting-lever No. 5 has been transmitted, the start-stop lever falls into its gap in the cam-sleeve, thus bringing the contact-tongue against the marking stop to transmit the stop signal.

"The resetting-lever, operated by a cam, draws back to the left the combination and locking bars. The depressed key is thus released and, rising, allows the trip-bar to rise also through the action of a spiral spring. The cam-sleeve is stopped at the end of its revolution owing to the pawl-abutment then being in the path of the pawls."

[NOTE.—In the solution of Question IV (p. 204) the word "sides" in the 14th line from the bottom, col. 1, should read "sets."]



MESSRS. BENTALLS' DISPLAY.

DISPLAY OF TELEPHONE APPARATUS AT MESSRS. BENTALLS LTD., KINGSTON-ON-THAMES.

FOLLOWING the displays of telephone apparatus which have recently been given at several of the large stores in London, a similar display was given by the courtesy of Messrs. Bentall on their premises at Kingston, from June 1 to 13.

The features were in the main similar to those of previous exhibitions, but special "pillar" diagrams had been prepared to show the growth in the Kingston area from 1905 to 1930 and an effective poster, with the title, "The world within your reach," showed a hand about to grasp the hand microphone which had settled down on a globe representing the earth. These, together with the maps showing the range of international telephone communications, formed an attractive background and drew attention to the exhibit.

The position allocated by Messrs. Bentalls was a most favourable one between the Tudor Restaurant and the Main Store, and checks taken at various times showed that an average of 500 people passed every hour. A large number of these showed interest in the display, which included coloured hand microphones, a model showing the method of recording calls, and an automatic coin box with glass sides, all of which proved a great attraction. The addresses given showed that there were visitors from all parts of the country, including places as widely apart as Edinburgh, Wareham (Dorset), Aberdeen, Blackpool and Hoddesdon (Herts), and among the enquirers was Lord Bradbury, of Treasury Note fame.

No less than 8,000 pamphlets and cards were distributed, the kiosk folder being particularly popular, and there can be no doubt that a large number of the public were roused to a keener appreciation of the telephone service than they had hitherto. That this interest was not evanescent is proved by the fact that several enquiries received since the exhibition closed can be definitely traced to literature distributed there.

The employees of Messrs. Bentalls seemed to be imbued with a spirit of helpfulness, and rendered all the assistance in their power on every possible occasion. On the two early closing days during the period of the exhibition arrangements were made for parties of them to visit the Kingston Exchange where they were able to see the actual working of the telephone. Invitations were also extended to members of the public to visit any exchange convenient to them, and several took advantage of the opportunity.

J. R.

THE LATE MR. HERBERT ARTHUR MILES.

MANY old C.T.O. friends and colleagues will find a common ground for the sincerest regrets at the news of the passing of Mr. Herbert Arthur Miles, which took place after only two days' illness, at his residence of Boscombe (Hants), on June 3 last.

Born in March, 1864, Mr. Miles entered the C.T.O. in March, 1879, but his evident talents in directions other than those of manipulative telegraphy soon marked him out for special duties, for example, those in connexion with the transfer of the old Submarine Telegraph Company to the Government in 1889. About six years later a still wider field was opened by his transfer to the Engineer-in-Chief's Department. The artistic bent of his father, Mr. Arthur Miles (a portrait painter, of Hampstead) found vent in the son in various handicrafts—woodwork, if the present writer's recollections of the prize lists of the late nineteenth century be correct, being one of them.

Under Henry Angel he studied mechanical science, and mechanical engineering under Professor H. Adams. The Telegraphists' School of Science, too, made a strong appeal to his technical tastes, and one well recalls the name of H. A. Miles as Chief Instructor of the workshop and its laboratory classes in the prospectuses of the eighties. The *P.O.E.E. Journal* of April, 1924, informs us that it was Sir William Slingo (then plain Mr.) who sought out Miles for this post. His certificates, teacher's diplomas, medals, honours, &c., in mechanical engineering, steam, mechanics, machine construction, carpentry and joinery, cabinet, metal and wood work, must of themselves have needed some fairly-sized receptacle to house. He had a facile pen in almost any direction, from that of a free-lance journalist to a treatise on "Mechanical Drawing for Science Teachers," or gardening! One of his hobbies was photography, which he attacked with that thoroughness which was part of the man himself, and to such effect that the Royal Photographic Society and the Camera Club were among his appreciative audiences. In open competition in 1913 he won the blue ribbon of the photographic world by his paper on "How to Make a Stereograph."

Mr. Miles served in the City of London Engineer Volunteers and during the air raid periods of the war was on "volunteer watch" for aircraft at Thorpe Bay.

The above is an all too brief account of H. A. M.'s activities. Perhaps the best tribute that could be paid to his memory were the words written concerning H. A. M. on his retirement, and which emphasised the happy, healthful influence which spontaneously seemed to emanate from this very human centre. He was, without doubt, guide, philosopher and friend to many in the service who were, indeed, accustomed to turn to him when sane,

helpful advice was needed. Wrote A. C. in the *P.O.E.E. Journal* in 1924, with words poignantly prophetic as they read to-day:

"'Go and see Miles about it,' had become an institution with us. It is a great loss that the hand and brain so constantly at our service in all kinds of work is to be at that service no longer."

To his dear, bereaved ones is respectfully proffered these inadequate efforts at appreciation of one who possessed "The individual will to seek the good."

J. J. T.

LONDON ENGINEERING DISTRICT NOTES.

Ewell Manual Exchange.

THE above exchange was opened successfully at 1.30 p.m. on May 27.

The equipment, installed by the Automatic Telephone Manufacturing Co., Ltd., has an initial multiple capacity of 1,300, the ultimate being 10,000. Transfers from the following exchanges were effected on the opening date:

Ewell (hypothetical on Sutton)	...	128
Sutton	...	18
Malden	...	9
Epsom	...	387

London County Council: County Hall, P.A.B.X.

An extension of the above installation, which is of the A.T.M., 50-volt type, has just been completed and brought into service. The following additional equipment has been provided: 300 preselectors, 24 final selectors, 46 first selectors, 54 second selectors and 40 relay sets for direct dialling to Hop Exchange. Additions were also made to the manual board equipment.

Staff Movements.

The London Engineering District, while offering the heartiest congratulations to *Capt. J. G. Hines* on his promotion to Staff Engineer, regrets that this promotion necessitates his removal from the district with which he has been identified for so many years. As Second-Class Engineer, Sectional Engineer and Assistant Superintending Engineer, *Capt. Hines* has had a unique district experience and there is probably no one who has a wider knowledge of the London plant, and conditions. For many years he has been intimately associated with the development of the London telephone area and its conversion to the automatic system, and in this connexion has served on several important secretarial committees. In the Lines Section of the Engineer-in-Chief's Office, of which he now takes charge, he will have a wider field still to survey, one in which his London experience will be very valuable.

Mr. J. Brown, Assistant Superintending Engineer, retired on June 30. He had been in the London District since 1900, serving successively as Second-Class Engineer, Sectional Engineer and Assistant Superintending Engineer. On the transfer of the National Telephone Company in 1912, *Mr. Brown* was responsible for much of the detail work in connexion with the reorganisation. Among this we may mention the Technical Section, in the Superintending Engineer's Office, which was formed under his control at that time. During the war he was in charge of the Centre External Section. The importance of this section will be realised when it is remembered that all the principal Government offices are situated within its area. On *Mr. Brown's* promotion to Assistant Superintending Engineer he was placed in charge of External Construction, and in this capacity had to deal, amongst other things, with the many important and difficult questions which often arise with local authorities in connexion with the provision of telephone plant. The gas explosion in the Post Office Holborn tube provided an opportunity at the close of his official career of testing and proving his capacity for dealing with difficult problems.

A representative gathering assembled on June 25, when *Mr. Gomersall*, on behalf of the staff, presented *Mr. Brown* with a mahogany bureau and lady's handbag and beaded bag for *Mrs. Brown*, as a token of respect and esteem from his colleagues and friends.

Mr. E. R. Gell.—In the presence of a large number of his colleagues, which included *Mr. Cornish*, Deputy Superintending Engineer, *Captain Hines* and *Mr. Brown*, Assistant Superintending Engineers, *Messrs. Dolton* and *Harvey Smith*, Executive Engineers, and *Messrs. Freeman*, *Timson Kimber* and *Hibberd*, Staff Officers, *Mr. Gomersall* presented *Mr. Gell* with a H.T. eliminator and an electric iron on behalf of the staff on the occasion of his retirement from the service on reaching the age limit. *Mr. Gell* who was the Higher Clerical Officer in charge of one of the expenditure sections in the Superintending Engineer's Office, had been in the London Engineering District since 1901.

Prior to that date he was in the London Postal Service and his total service covered more than 40 years. His sterling character and invariable good humour had made him very popular, while his ability for detail and accuracy made him a valuable officer in the department. We understand he has bought a new house and intends to make an intensive study of gardening. We anticipate the greatest possible success for *Mr. Gell* in this direction and wish him long life and good health to carry it out.

Mr. A. W. Brockett.—Quietly and quite in accordance with his disposition our old friend *Brockett* slipped away at the end of June, having reached the age when the department releases one from service. He entered the Engineering Department somewhere about 1899, after some years spent in the C.T.O. The whole of his engineering experience has been in the London Engineering District, and at the time of his retirement he was the Higher Clerical Officer in charge of the district cash accounts.

He is a man of varied accomplishments. He is a skilful worker in wood carving and an authority on antique furniture, while his capability as a musician is of an exceedingly high order.

The fine memorial in the hall of the Superintending Engineer's Office to the staff of the London District who served in the war is a striking example of *Mr. Brockett's* artistic skill.

Mr. Brockett will be greatly missed and our wishes for his continued health and happiness go with him. He received a table gramophone and loud speaker as a memento of the esteem of his colleagues.

Mr. F. Blick.—We tender on behalf of the London Engineering District a hearty welcome to *Mr. Blick*, who returns to the London District on July 1 as Assistant Superintending Engineer, in place of *Mr. Brown*, retired. In this case it is a return home, as *Mr. Blick* was for very many years in the London Engineering District. Prior to the transfer he was one of the National Telephone Company's Divisional Engineers, and after that event served under the Post Office in the South-West Section and in the Technical Section. For the past five years he has been in the Lines Section of the Engineer-in-Chief's Office.

Mr. G. Bullimore.—On May 30 *Mr. G. Bullimore*, Inspector, City External Section, retired, having reached the age limit. In the presence of a number of his colleagues he was presented by the Sectional Engineer, *Mr. Harvey Smith*, with a mahogany chiming clock and an umbrella. *Mr. Bullimore* will be especially remembered by those officers still with us who served with the National Telephone Company. He entered the service of that Company in June, 1887, and before transfer to the Post Office in 1912 was regarded as one of the leading practical exponents of cabling and jointing. As was shown at the presentation, his experience in those matters was an extensive one, including the restoration work after the drastic fires at London Wall, and Bank Exchanges and at the Oxford Court test frame. *Mr. Bullimore's* health of late has been none too good, and he takes with him into retirement the best wishes of all his colleagues for a speedy improvement in this respect.

London Engineering District Sports Association.

Cricket.—*Civil Service Shield*, 1st Round Replay: L.E.D. v. *Savings Bank*.—Bad luck has been the L.E.D.'s share in this competition—in the first match bad light robbed them of victory and in the replay *H. L. Webdale*, the best bat of the side, was injured in the face from the third ball of the match, when keeping wicket. Stitches were necessary, and *Webdale* took no further part in the match. *Savings Bank*, batting first, scored: *Searle* (Kingston) bowled finely for L.E.D., taking 6 wickets for 25 runs. L.E.D. lost a wicket with the first ball through a called short run. This cost the L.E.D. the Captain's wicket, and with *Webdale* injured, and *P. K. Broomfield* assisting the C.S. team at Portsmouth, it was not surprising that wickets fell cheaply. L.E.D. were all out for 45.

Team—*Punchard* (Capt.), *Whiting*, *Webdale*, *Lever*, *Haythornwaite*, *Roberts*, *Ellis*, *Lever*, *Searle* and *Hunt*.

Athletics.—The L.E.D. for the first time entered a team for the C.S. Championships held at Stamford Bridge on June 13, and were represented by *Cheyney* (Abercorn), *Humphery* (Abercorn), *Walker* (Welbeck) and *Smith* (M.L.B.)

Misfortune also attended this venture. *H. V. Watson* (Epsom), our best furlong runner, injured his knee two days before the race, and during the race his deputy was completely stopped on the track by two runners who had handed in batons, but had not the sense to keep the track clear. The 10 yds. lost in this way could not be caught up.

L.E.D., however, finished a respectable fourth out of 8 teams starting. *R. C. W. Walker* (Welbeck) was third in the Long Jump Championship.

Swimming.—The L.E.D. team, champions of the Civil Service for 1928-29 and 30, have this year, in addition to C.S. Competitions, entered the 1st Division of London Business Houses League and are, up to the present, unbeaten.

The standard in this league is far above that of the Civil Service.

Bowls.—A match has been arranged with the strong *Parsons Green Club*. The L.E.D. team has not yet been selected.



The Well.

Off the hard road, rough with its native metal, over the stone stile, along the wavering track, through the gate in the hedge and near a benign oak is the well. It is not a conventional well, there is no circular brick wall, windlass, chain and bucket. The dark depth, the hollow rumble, the distant and faint stream of water and the chill mystery are absent. Instead, the water leaps joyously from a huddle of boulders into a worn basin, self-hewn out of the mother rock. It falls sparkling over the lip, gushes into a narrow channel and gurgles away into the silence. Musical rather than mysterious, free rather than bound.

Strange qualities are attributed to the well. The matter-of-fact will tell you that the water is slightly chalybeate but (in a tone, slightly ironic) as to its magical qualities—well, well. True, it is called St. Somebody's well, but after all who was St. Somebody and if she or he ever existed there is no ascertainable foundation for the supposition that the saint ever resided in the neighbourhood. Oh, yes; there were tales told of its virtue—how that well was born in a night, how that if you drank of its water all your vices would disappear and be replaced by the more angelic qualities. It was said that if you washed in water taken from the well at midnight on St. Somebody's Eve your enhanced beauty would so touch the sophisticated sense of your swain that he would hasten his tardy, momentous question and that surely you would be going up the aisle to the altar before the year was passed. But, of course, ha, ha, these were old wives' tales or tales invented by lovesick maidens. The flow by rights ought long since to have been piped or perhaps a reservoir constructed somewhere about where that there cow be standing so as the village below could get a supply.

You can't put fairy tales into pipes, unless they be the pipes of Pan, or their virtue is gone. The legend is lost that is proved. The track that is paved and curbed loses its beauty; the light from the power-station puts out the stars.

So I hope they keep St. Somebody's well just as it is, with its music, purity and laughter, and let those who can still keep their faiths and hopes.

PERCY FLAGE.

Our Wonderful Age.

Truly we are living in a wonderful age, for the masses especially—and what do I see in the future? Automatic machinery everywhere, making it a glorious age of self help.

With the humble 6d. or 1s. what cannot we buy? Come with me down the Strand at 2 o'clock in the early morning. Are you hungry? We stop outside the well-known shop of Jolly's. Yes; there is the automatic machine still more than half full. Tea, butter, ham sandwiches, tin of salmon, with ½d. put on the tin for change because the cost is 11½d. With the talisman of 6d. or 1s. all these are within our grasp.

How splendid for the stranded wayfarer in this modern age, and how truly awful for the homeless and the hungry, seeing through the glass receptacles such a tempting array of food in every variety, without the wherewithal with which to buy any.

I love this age of machinery. It makes one so independent of mankind's help. [Percy Flage, please note.—ED.]

- 1d. and ½d. in the slot for stamps.
- 1d. in the slot for electric light, also gas.
- 1d. in the slot for milk.
- 2d. in the slot for the automatic telephone.
- 6d. in the slot for fruit, sweets, chocolates, biscuits and cigarettes.
- 1s. in the slot for almost anything.
- 1s. talkie of our own voice for the gramophone.

'Tis indeed the age of magic.

The ether, the wireless in almost every home, music, music everywhere—I think it is the most wonderful world that mortals have ever lived in.

Cheerio everybody.

"RENROT."

Potted History.

The First "Wrong Number" (according to *Punch*).—Memorable amongst the men with beards in Elizabeth's reign was her favourite, Essex, whom she brought to execution by mistake in the following romantic manner. Essex was sent to Ireland to quell a rebellion which the Irish were very treacherously carrying on in a bog in Munster. Becoming fatigued with the rebellion, however, he dashed out of the bog and left it. For this Essex was sent to the Tower, where he was shortly afterwards joined by other favourites of the Queen (such as Burleigh, Sidneigh, Watneigh, Hurlingham, &c.). Essex had a secret arrangement with Queen Elizabeth that he was to give her a ring whenever he was going to be executed, and she would relieve him. But although, according to the arrangement, he tried to get into communication with the Queen, he was given the wrong number and was thus executed after all, along with the other favourites.

"God may forgive you," was Brown Bess's memorable comment to the operator, "but I never will."

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LIVERPOOL NOTES.

Dunedin Calling.—The District Manager, shivering in the early morning chill at 6 a.m., discovered that it really was a warm and sunny afternoon in the antipodes. In making the first telephone call from Liverpool to New Zealand, Mr. Gauntlett inaugurated yet a further extension of the overseas service from this district. What would have been regarded a few short years ago as a romantic dream is now become a commonplace everyday affair, and no doubt in the near future there will be no civilised quarter of the earth to which it will not be possible to speak.

I.O.M.—The usual activities, telephonic and otherwise, accompanied the T.T. Motor-Cycle Races in the Isle of Man this season. Special arrangements were made for the convenience of the Press and for the B.B.C. Round the course information and control stations were provided with telephone facilities of a special nature. These were described in an article by Mr. David in the *Journal* of August, 1930. As usual, the arrangements made by the Engineers and Traffic Officers in co-operation were entirely satisfactory.

Golf.—Notwithstanding the unsettled weather conditions Liverpool and Manchester had an enjoyable encounter on the Hill Warren Golf Course at Warrington. On this occasion Manchester was the victorious side. Our official chiefs, Mr. Maddan and Lt.-Col. Kempe, honoured the occasion by taking part, and added to the pleasures of the meeting.

Thumbnail Lecture at a Meeting with Operators.—Tone.—The meaning of tone is sound or accent. The tone adopted by a telephone operator in answering or speaking to a subscriber is all important. While an operator may be smart and correct, a wrong tone will spoil the effect of both.

For the working of the telephone system we have adopted standard expressions, but everything depends on the tone in which these are uttered. For instance, in how many tones can the simple expression "Number, please" be uttered? You can give the caller various impressions by the way you answer with this phrase.

A listless tone, indicating boredom; a casual tone, indicating lack of interest; the snappy tone, indicating incivility; but the tone is that rising inflection giving the impression of pleasure in being out to assist and to give service. Such a tone is one which will produce a cordial response from a subscriber.

It is admitted that the constant reiteration of the same phrase is liable to lead to a tendency to monotony, but don't fall into this habit.

Then again, in repeating the number back. Do it deliberately and do not slur, but enunciate the figures clearly and distinctly and so give the subscriber the opportunity of correcting you if wrong. It may take a trifle longer, but it will be time well spent. The tone which will convey the impression that the operator is sure that she has accurately obtained the call is the proper one.

The advantage is a saving of time, as the subscriber is satisfied that no reply is necessary and it gives him confidence that his request will be promptly and securely handled.

NORTH WESTERN DISTRICT NOTES.

Blackburn.

BOUQUETS are handed by an unprejudiced and discriminating public to the "Voice with a Smile," and who can wonder at this, so long as we can number artists of the calibre of Miss Ferrier (Telephonist) of Blackburn Exchange, in our midst.



[Photo: Leslie's Studios, Blackburn.]

MISS KATHLEEN FERRIER.

Miss Kathleen Ferrier well earns the designation of a musical prodigy. Although only just 19 years old she has attained distinction in the profession, her successes including some of the "plums" offered in open competition.

Miss Ferrier inherits a passionate love of music from her parents, and at the age of 11 became a very apt pupil. She does not know the meaning of failure. Her most notable awards include the diploma and grand pianoforte presented in 1928 at a test held under the joint patronage of the British Federation of Musical Competition Festivals, the Federation of British Music Industries, the Music Masters' Association, and the British Music Society, in the class restricted to entrants of the age of 16 and under. The fact that the examination had two such celebrated adjudicators as Mr. C. O'Connor Morris and Mr. Harvey Grace, both well-known composers, is sufficient indication of its importance.

In 1930, Miss Ferrier won the gold medal at the Liverpool Competitive Musical Festival, an event open to pianists of all ages. On this occasion a silver cup went to her teacher, Miss F. E. Walker, in recognition of the success achieved. Last year, also, Miss Ferrier carried off first prizes at the Lytham and Blackpool Musical Festivals, and she was selected to broadcast from Manchester. She has played at the Blackburn Municipal Concerts and, along with her father, was a member of Dr. Brearley's Contest Choir. Her great achievement was to obtain the joint degrees of A.R.C.M. and L.R.A.M. at the first attempt.

Preston.

The second interdepartmental Golf Match of the season between the Surveyor's and District Manager's staffs at Preston was played over the course of the Preston Golf Club at Fulwood on the evening of Monday, May 18. A very enjoyable evening was spent, with the usual celebrations at the 19th. On this occasion the District Manager's staff for once succeeded in turning the tables on their redoubtable opponents.

The next meeting has been provisionally arranged for some time during June over the Pleasington Course.

Tell the World: Extracts from Subscribers' Letters.

Bury Exchange.—The priest-in-charge requests that his appreciation of the kindnesses, good service, and courtesy extended to him by the Bury operating staff be conveyed to them.

He stated that the Bury service is the best he has ever experienced and cannot speak too highly of the service generally.

Penrith Exchange.—I should like to thank your Penrith staff for their prompt and kind attention at all times.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of May resulted in a net gain of 3,233 stations.

The number of kiosks working at the end of May was 2,398, and there were advice notes outstanding for 146 more. At the end of May last year the number was 1,828, which shows an increase during the last 12 months of 570.

It is a pleasure to be afforded the opportunity of extending our congratulations to several members of the Contract Branch who have just been promoted. Mr. G. H. Tree, of the Development Section, has been promoted to the rank of Staff Officer and Mr. J. A. Dickinson, Mr. W. Hume and Mr. S. T. Faulkner have received Higher Clerical appointments.

Prominence has been given to the City District Office, St. Bride Street, E.C.4, by the display in the windows of posters advertising the telephone. One of the recent posters which attracted particular attention depicts a Telephone Directory in colour with a queue of intending subscribers entering its pages.

London Telephone Service Sports Association.

Athletic Section.—*London Telephone Service Annual Sports.*—The second annual sports and gymkhana of the London Telephone Service took place on Thursday, June 4, at the Civil Service Sports Ground, Chiswick. All the events were well contested, there being 155 entries from the women, and 31 entries from the men. The weather was very kind: brilliant sunshine prevailed, with just sufficient wind to keep the competitors cool, without chilling the spectators, of whom there was a fair attendance, but many more should have come. This is an excellent evening's entertainment and deserves to be patronised to a much larger extent by the staff of the Controller's Office.

The Controller, Mr. W. H. U. Napier, C.B.E., was present, and his daughter, Miss Moyra Napier, distributed the prizes. The Deputy Controller, Mr. M. C. Pink, officiated as Referee, and the Assistant Controllers, Mr. Dive and Mr. Tinniswood, also assisted with speeches of encouragement. Miss Cox and Miss Mahlendorff were also present.

Special mention should be made of the wonderful running of the L.T.S. Relay Team (the Misses M. Menzies (Ealing), J. L. Rosier (Trunks), D. Uglov (Putney), and V. J. Bannister (Trunks), who defeated the seven contesting teams from other departments. This quartette runs in fine style all the way through, from Miss Menzies, who streaks round the first stage, and hands over her baton full 10 yds. ahead of the next pursuer, to Miss Bannister, who goes all out to win the final stage, defying all competition.

Miss Menzies also won the Ladies' 100 yds. Championship which has been instituted and was run for the first time at this meeting. The ladies' 100 yds. handicap was won by Miss D. Searle (Toll B), who also won the three-legged race with Miss Webster, and was third in throwing the cricket ball. Miss Pawsey, a girl probationer, ran second in the 100 yds. handicap, and also second in the girl probationers' race, won by Miss Doubrowsky. Another probationer who distinguished herself was Miss Beaves, who won the sack race, and took second prize for throwing the cricket ball.

Amongst the men, the 'Traffic Branch easily outshone, thanks to the predominance of young blood. Mr. Rollings (TD/S), won the 100 yds., with Mr. Read (TD/WC) second; H. W. Merrick (P) took the 880 yds. in 2 minutes 11 seconds, with F. E. Bishop (T/ED) second; and Mr. Bishop won the mile scratch walk in 9 minutes 2 seconds; G. D. MacMillan (PK) carried off the throwing the cricket ball, with E. A. Sweetingham (T/AG) second; whilst C. Marland (CQ) was second in the veterans' 100 yds. handicap, and third in the mile walk. The Traffic Branch also won the relay race, so that all that was left for the other branches was the veterans' 100 yds. (S. P. Wilson, Contract Branch, scratch) and a second in the mile walk, J. T. E. A. Waddell, Accounts Branch.

Considerable amusement was provided by the gymkhana events, including egg and spoon race, three-legged race, wheelbarrow race, sack race and a game of push-ball to finish up with. The children were not forgotten, and special races were open to toddlers and other youthful spectators.

The organisers deserve great credit for a well-arranged programme carried through to time.

Civil Service Athletic Association.—It is gratifying to report that at the athletic meeting held at Stamford Bridge on Saturday, June 13, the L.T.S. team won the 440 yds. inter-departmental relay race (women) for the third year in succession. The runners were Misses Doubrowsky (Girl Probationers), Rosier (Trunks), Menzies (Ealing) and Bannister (Trunks).

In reporting the event in the *Daily Telegraph*, Bevil Rudd stated that "Miss Doubrowsky, of the L.T.S., was the most diligent runner of the afternoon."

Another L.T.S. success at the same meeting was Miss Menzies, of Ealing Exchange, who came second in the 100 yds. The winner was Miss Hiscock, of the Foreign Office, who retains the championship.

Football Section.—This section of our sports activities held a dinner at The Feathers, St. James's Park, on Thursday, June 11. The chair was taken by Mr. Hugh Williams, who, after the company had done justice to the meal provided, referred to the reason of such a festive occasion. It was to celebrate the accession of the L.T.S. club to the top of the Civil Service League.

After reaching a similar position in the Second Division last year, it was almost unprecedented that they should rise with such a meteoric spurt to the position they had now reached. The Chairman announced that the shield was not available for presentation, and even if it were, its condition was such that almost every member could possess a fragment; to combat this, the Secretary, Mr. Tom Cully had prepared certificates for each of the players, appreciating their co-operation in reaching such a high standard during the past season.

After tables were cleared all gathered round and joined in community singing, stories and songs.

A most enjoyable evening, and all are looking forward to a similar gathering next year when further triumphs may have to be reported.

Presentation to Mr. H. A. Raison.

Many friends of Mr. Raison, Assistant Superintendent of Traffic, so long a member of the Statistical Section of the London Telephone Service Traffic Branch, met on June 2 last to bid him "Good-bye" and to present him with some tokens of their regard and good wishes on the occasion of his departure for Egypt, where he is taking up the post of Traffic Manager in the Egyptian Department of Telegraphs and Telephones. The presentation was made by the Controller, the gifts consisting of a leather kit-bag, a silver cigarette case, a camera and a pocket flask.

Mr. Napier referred to Mr. Raison's outstanding qualifications and to the general esteem in which he is held, remarking that he understood that more than one of his gentler colleagues in the Traffic Branch would be quite willing to accompany Mr. Raison to Egypt.

Mr. Dive wished Mr. Raison every success in his new undertaking.

Mr. Jackson, who was associated for some years with Mr. Raison on the Statistical Section, paid tribute to his colleague, and said that he was leaving the land of the Fair Rose for the land of the Pharaohs, remarking, with regard to the choice of gifts, that the kit bag was to pack his troubles in, the camera to ensure that he always looked for the bright side, the flask to keep his spirits up (or in) and the cigarette case to symbolise the ending of his troubles in smoke.

Mr. Raison, in expressing his appreciation of the gifts and for the goodwill which prompted them, said that his one regret was that he had to leave the Telephone Service in which he had made many friends and had spent many happy years.

Mr. Raison's numerous colleagues hope that his absence will not extend beyond the three years of foreign service now contemplated.

Personalia.

Promotions to Asst. Supervisors Class II.

Miss M. J. Smith, of Royal Exchange.
 " A. Walker, of Central Exchange.
 " A. Cole, of Walthamstow Exchange.
 " E. A. Lee, of Gerrard Exchange.
 " A. L. M. Standen, of Putney Exchange.
 " H. Cox, of Hayes Exchange.
 " I. E. Weston, of City Exchange.

Resignations on Account of Marriage.

Telephonists.

Miss A. F. Salisbury, of Avenue. Miss P. A. Reeves, of Paddington.
 " G.E.M. Bayliss, Ambassador. " D. I. Williams, Popesgrove.
 " D. C. Prior, Brixton. " I. Glaysher, Riverside.
 " E. G. Roebuck, Bishopsgate. " I. A. Loukes, Royal.
 " G. D. Greenland, Battersea. " Hazzledine, R. A., Regent.
 " E. M. Popplewell, Central. " Eva Garrett, Regent.
 " M. I. Ellis, Central. " N. R. Merrells, Regent.

Miss E. M. Reed, Central.	Miss N. L. Redhouse, Speedwell.
" I. Wordon, Central.	" G. Soames, Tudor.
" I. C. Dale, Clissold.	" W. L. Tanner, Tudor.
" S. G. Rogers, Clerkenwell.	" B. H. M. McKenzie, Tandem.
" M. E. Monkland, Chiswick.	" B. W. Kaylor, Tandem.
" K. Wickham, City.	" E. R. Weare, Toll "A."
" R. Triplow, City.	" M. B. Howes, Trunk.
" D. M. Lilley, City.	" M. Bray, Trunk.
" D. A. Pewer, City.	" M. B. M. Hider, Trunk.
" G. A. Hounscome, East.	" R. Hilton, Trunk.
" R. E. Reissland, Flaxman.	" W. Pollard, Trunk.
" E. Wood, Greenwich.	" S. F. Burgess, Trunk.
" E. F. M. Lacey, Hop.	" V. Wilson, Trunk.
" M. D. Lloyd, Hop.	" G. L. M. Griffin, Temple Bar.
" S. N. Hopkins, Hop.	" I. M. W. Richardson, Thornton Heath.
" M. F. Pincott, Kingston.	" G. M. Walden, Thornton Heath.
" J. Levy, Museum.	" D. A. Adams, Victoria.
" E. F. Billman, Museum.	" F. M. Turner, Victoria.
" D. R. E. Ford, Mayfair.	" I. D. Williams, Victoria.
" V. E. Lines, Mayfair.	" D. Dunville, Welbeck.
" B. M. Carvely, Mayfair.	" D. E. Stroud, Streatham.
" E. A. Hines, National.	

MANCHESTER NOTES.

Traffic Branch.—During the past few months the ranks of the Traffic Staff have been seriously depleted, as we have lost five of its valued members.

Mr. Richards, Traffic Superintendent, Class II, left to take up the position of Traffic Superintendent, Class I, at Colchester. The occasion of his going was celebrated by a hot-pot supper and sing-song. During the evening Mr. Whitelaw spoke of the long and useful service Mr. Richards had rendered in Manchester and hoped he would be happy in his new position. In addition, Mr. Richards was presented with the following articles from the Traffic and Exchange Staffs: Grand-daughter clock, silver cigarette case, cut glass bowl, dinner wagon and an umbrella.

Messrs. Sanderson, Ross and Major Wilson, Assistant Traffic Superintendents, all left us to return to similar positions in their home towns. The two former colleagues were presented with silver wristlet watches and the latter was the recipient of a handsome loudspeaker.

Mr. Whitelaw made the presentations in each case, and Mr. Crombie said that if the Traffic Staff continued to leave so rapidly, instead of being a comparatively new comer, he would shortly be the oldest member.

We welcome to our midst Mr. Heberton, on promotion to Traffic Superintendent, Class II. He has taken charge of the Trunk Division. Also we extend a hearty welcome to Messrs. Wood, Walker and Hartnell, Assistant Traffic Superintendents, and trust that their sojourn in Manchester will be happy and that the experience gained may be beneficial.

Reconditioning of Manchester Trunk Exchange.—The entire reconditioning of the Manchester Trunk Exchange, which has been in progress for over a year, is nearing completion. New trunk sections of the latest type have been installed, and other improvements have been effected. As the change has been a gradual one, the working of the old and new positions simultaneously occasioned some difficulties to the staff, but they rose to the occasion and maintained an excellent service during the transition period.

It is hoped to publish an article on the new arrangements at an early date.

Manchester Automatic Scheme.—The work involved this year will not only be the heaviest but the most trying and exacting that we are likely to experience at any period of the automatic scheme. The following works are involved:—

- (1) Transfer of Junction Centre from the Central to Toll Exchange.
- (2) Opening of call display positions at the following exchanges:—
 Didsbury, Droylsden, Eccles, Prestwich, Radcliffe, Chorlton, Rusholme, Swinton, Trafford Park, East, Broughton, Cheetham Hill.
- (3) Transfer of 2,100 Blackfriars and 800 Central and City subscribers to the Blackfriars Automatic Exchange at Telephone House on June 13.
- (4) Transfer of a further batch of the Central and City subscribers to Blackfriars in September.
- (5) Transfer of all call offices from Central, City, &c., Exchanges to the Toll Exchange in October.
- (6) Transfer of the remaining Central and City subscribers proper to Blackfriars Automatic Exchange in December and early part of next year.

(7) Conversion of the following exchanges to automatic working in December:—

Denton, Heaton Moor, Longford, Sale, Stockport, Woodley.

(8) Correction of a number of exchange areas.

The Toll "B" board was opened for full day and night service on May 1, and call display positions at the following exchanges were opened on this date, both for traffic from Toll "B" keysenders and from the automatic subscribers: Chorlton, Didsbury, East, Eccles, Radcliffe, Rusholme and Trafford Park. The arrangements are working very satisfactorily and all those responsible did everything possible to make the working a complete success.

It is hoped to publish separate articles regarding the Mass Testing and other arrangements which were made prior to the opening of these positions.

Operating Instructions.—Owing to the transfer of the Junction Centre from the Central to the Toll Exchange with an entirely new method of operating, the opening of call display positions at a number of exchanges in the automatic area, the introduction of the seven digit key sender positions at the Toll Exchange, and the modified procedure at the Toll information desk, &c. it has been necessary to revise the operating instructions entirely, and to prepare additional instructions to meet the new conditions. This work has been completed satisfactorily, and has entailed heavy pressure and much concentrated thought on the part of the traffic offices immediately concerned. The many sections are now being prepared in book form, and when issued it will certainly be one of both weight and measure telephonically.

Training of Staff.—During the past 9 weeks, owing to the large number of telephonists required for operating the various classes of positions at the Toll Exchange, an intensive system of training has been necessary. The training staff has had to be augmented to cope with the additional work and, altogether, it has been a strenuous time for all concerned.

Training School.—The provision of the additional positions to cover all operating procedure connected with automatic working is nearing completion, and, when finished, the Manchester new training school will be the most up to date in the Provinces.

East Exchange.—Manchester leads the way again. The question of providing voice-frequency 4- and 7-digit keysending from "A" positions at this exchange is under consideration.

Telephonists' Meetings.—These go on unabated. For instance, some 16 meetings have been held with the Trunk Exchange staff, and arrangements were made so that every telephonist was able to attend one of these meetings. The matters specially discussed were: Necessity for accurate timing of all calls, need for clear announcement of lapse of 3 minutes, 6 minutes, &c., at the proper time, necessity for clear figuring on tickets, and, where necessary, clearly worded explanatory notes so as to obviate reference to controlling operators in case of written complaints. Difference between plug in and answer—necessary for proper clearing of lines. Reporting of all cases of poor transmission. Need for improved routings, drawing attention to junction delays. Every opportunity to be taken of advertising the fixed time and personal call services. The operators showed a keen and intelligent interest in the points discussed. The Trunk and Phonogram observation results show that the staff have given of their best in order that Manchester may stand out well when their results are compared with other centres. These meetings were attended by the Traffic Superintendent, Class I, Traffic Superintendent, Class II, in charge of the Trunk Division, and the Trunk Exchange Superintendent.

C.T.O. NOTES.

Promotion.

Mr. P. E. Long, Overseer to Assistant Superintendent. Mr. C. A. N. Edwards, Telegraphist to Overseer. Miss E. Dickins, Telegraphist to Assistant Supervisor (Telegraphs). Miss A. C. Bolton, Telegraphist to Assistant Supervisor (Telegraphs). Miss H. M. Gowan, Telegraphist to Assistant Supervisor (Telegraphs).

Retirements.

Messrs. E. J. Allen, J. G. Wellington and B. G. T. S. D. Callaway and Miss K. Woodfield, Telegraphists, and Mrs. C. S. Clarke, Permanent Unestablished Telegraphist.

Obituary.

We regret to record the death of Mr. K. A. Chetwood. He contracted heart trouble as a result of war service and he faced his last years of suffering bravely. To Mrs. Chetwood, her daughter and son we extend our deepest sympathy.

Another late colleague, Mr. C. H. Quinn, has died after enjoying his pension for only two years. His loss is mourned by his old colleagues.

C.T.O. Amateur Gardening Association.

The Association arranged for a party to visit the Royal Horticultural Society's grounds at Wisley, where the visitors were entranced with the beautiful variety of Nature's plants.

C.T.O. Veterans.

On May 7 the first ramble of the season took place. The venue was Kew, and with good weather a very pleasant time was spent.

Later in the month the Gramophone Company's (His Master's Voice) works were visited. A very instructive and enjoyable tour of the buildings was made.

Sport.

Bowls.—The C.T.O. played its first Bunbury Cup Game this season against the L.P.S. and won by 9 shots, the scores being C.T.O. 62, L.P.S. 53.

Cricket.—The Centels chances of progressing far in the Curtis-Bennett Shield disappeared as the result of the replayed tie with the Owls at Walthamstow on Thursday, May 28. Owls batted first and were all out for 58. The prospects of a win were very rosy when our opening wicket compiled 25, but the unexpected happened and the innings closed for seven runs less than our opponents. Sangwine, for the Owls, took eight wickets for six runs. For the Owls, Higgins was top scorer with 11. Drummond 22 and L.A. Smith 13 headed the Centels batting, and W. T. Cook with five wickets for 36 and Little three wickets for 4 took the bowling honours.

Friendly Matches.—May 11—Buckingham 47, Centels 153; May 31—Carlyle and Balmoral 117, Centels 183.

The Centels v. Fortels match on June 7 was so interfered with by rain that only some batting practice could be indulged in.

SCOTLAND WESTERN DISTRICT NOTES.

It is now some time since there was any news from this district, of recent date, however, two promotions have come the "way" of Scotland Western. The first was the promotion by examination of Mr. Martin F. Brewster, Clerical Officer, to Assistant Traffic Superintendent, in training. On his departure to Edinburgh, Mr. Brewster, who is the first of the clerical officers in this grade since the amalgamation in 1916 to advance, was presented with a standard electric lamp. The presentation was made by Mr. Thyne, the District Manager, who referred in appropriate terms to the work performed by Mr. Brewster, both in the office and in the equipping of himself by study, to qualify for his new post. Words of appreciation of his services were also expressed by Mr. Craig, Traffic Superintendent, Class II, and Mr. Dunn, Staff Officer. Speaking on behalf of the rank and file of the staff, Mr. Muir, Clerical Officer, expressed their best wishes. In a short but pointed reply, Mr. Brewster thanked the staff most cordially for their token of appreciation.

The second promotion was that of Mr. A. W. Buchanan, Assistant Traffic Superintendent, who had been appointed Traffic Superintendent, Class II, in the Cardiff District. The District Manager, Mr. Thyne, on behalf of the staff, presented Mr. Buchanan with a camera and two crystal vases. In his remarks Mr. Thyne made mention of the fact that with the completion of the conversion of Ayr and Prestwick Exchanges to automatic working, this was a fitting close to Mr. Buchanan's career in this district as an Assistant Traffic Superintendent. Appreciative remarks were also made by Mr. Finlay, Traffic Superintendent, Class I, Mr. Craig, Traffic Superintendent, Class II, Mr. Reid, Assistant Traffic Superintendent, Mr. Dunn, Staff Officer, and Mr. Brodie, Contract Manager. Mr. Buchanan, in replying, thanked the staff for their tokens of appreciation.

Another event which occurred recently was the marriage of Mr. James Gibson, Higher Clerical Officer. The staff on the occasion of Mr. Gibson's marriage presented him with a silver tea service. Mr. Thyne, District Manager, made the presentation, and in a short speech conveyed to Mr. Gibson the best wishes of all members of the staff. Mr. Dunn, Staff Officer, also added a word appropriate to the occasion, to which Mr. Gibson suitably replied.

GLASGOW TELEPHONE NOTES.

Glasgow Post Office War Hospitals Entertainments Committee.—The big event of the year was successfully carried through on Friday, June 19th, when 80 ex-service patients from Ralston and Erskine Hospitals, with members of the Committee, went by motor bus to Loch Lomond. Mr. Currie, Acting Postmaster-Surveyor, and Mrs. Currie, represented the Post Office. The route was via Helensburgh, over the hills to Luas, where comfortable launches awaited the party ready for the sail to Balloch. The buses were in readiness at the landing stage to convey the party to Balloch Castle tea rooms. We have been catered for by the Manageress on previous occasions, and the success of the tea was a foregone conclusion. The next scene of action was the putting green, where some fearful and wonderful scores were returned. But as a mirth provoking number, nosey-matchbox will be hard to beat. Messrs. Alexander, by supplying buses which were the last word in comfort, provided the magic carpet to convey the party to the Queen of Scottish Lochs, but even under the happiest conditions the return journey must be made.

The weather clerk must be an *ex officio* member of the Committee, for in the midst of a June which has produced the worst weather on record, he reserved a good day for the outing.

Jade and Ivory Phones?—One hundred and fifty new telephones—or variations of the existing installation—per week in Glasgow are the result of the first venture of the P.O. into exhibition publicity. The most popular of the 'phones are the new hand microphones, with which the *Bulletin* office is equipped. They are so sensitive that you can almost hear the person at the other end of the wire change his mind. Women are the chief buyers—and they are ordering the instrument in boudoir shades of gold, silver, jade and ivory.

[From the *Bulletin*, Glasgow (Exhibition Edition).]

At the Post Office stand in the Kelvin Hall an exhibit shows the internal—I nearly wrote infernal—workings of the A and B coin-collecting telephone boxes. Aberdonian visitors are particularly anxious to know the precise procedure necessary to obtain the subscriber and at the same time get their money back.

From the *Evening Times*, Glasgow.

On Interruptions.—It is not necessarily desirable that management should "eliminate other thoughts," for it may not be true that they have "a tendency to retard the work." There is something depressing in Dr. Wilson's article on the shell-shock men, where he says that the best man in the trenches was the man who had cut off all mental visions from the outside world. It is not necessarily the case that the mind is more efficient from the lack of interfering interests. One of the best psychologists of the past generation always stated that he worked better amid distractions, that his mind was more alert when he had to bring it, by a deliberate act, from wandering. Extraneous aids, such as the banishment of other noises, or allurements, do not help the mind as much as we suppose, and many of us have discovered that we can concentrate better where there are interruptions than where we are given what seem to be the perfect conditions of quiet.—(J. Lee.)

Few people realise the full evil of an interruption, few people know all that is implied by it. After warning nurses against the evils of interruption, Florence Nightingale says: "These things are not fancy. If we consider that, with sick as with well, every thought decomposes some nervous matter, that to obtrude another thought upon the brain whilst it is in the act of destroying nervous matter by exertion, we shall remember that we are doing positive injury by interrupting. This rule applies to the well quite as much as to the sick. I have never known persons who exposed themselves for years to constant interruption who did not muddle away their intellects by it at last." People think that an interruption is merely the unhooking of an electric chain, and that the current will flow when the chain is hooked on again, just as it did before. To the intellectual and imaginative student, an interruption is not that; it is the destruction of a picture.—(Hamerton.)

No one can understand how I value a succession of hours, for the interrupted ones are, in my opinion, not only completely lost, but hurtful and disturbing into the bargain. People do not understand what I am robbed of just by an interruption.—(Goethe.)

If we wish our science to be complete, those matters which promote the end we have in view must one and all be scrutinised by a movement of thought which is continuous and nowhere interrupted; they must also be included in an enumeration which is both adequate and methodical.—(Descartes.)

A man is hindered and distracted in proportion as he draweth external matters to himself.—(A Kempis.)

The quiet minded find existence at its best when their condition of emotional tension is comparatively low, and when their trains of thought are not broken in on by direct sensations. People of the quiet temperament suffer much from the pressure of the more active spirits around them, but

they suffer more because they are constitutionally indisposed to external action, and because their emotions are accentuated to find an outlet for their desires.—(Bligh.)

He who would help himself and others should not be a subject of irregular and interrupted impulses of virtue, but a continent, persisting, immovable person. It is better that joy should be spread over all the day in the form of strength, than that it should be concentrated into ecstasies, full of dangers and followed by reactions.—(Emerson.)

Tutt, bein' married, most likely is used to interruptions, an' is shore patient that away.—(A. H. Lewis.)

LEEDS DISTRICT NOTES.

The interest created by the remodelled Telegraph Instrument Room at Leeds continues to exercise its influence when official itineraries are being compiled. Prominent amongst our distinguished visitors of the past month were Mr. E. Raven (Second Secretary) and Mr. J. Y. Bell (Asst. Secretary, Est. Beh.); Mr. Blake, of the Secretary's Office, Dublin; Mr. Shaw, Superintending Engineer, G.P.O., Dublin, and his Assistant, Mr. Sullivan and Mr. Neilsen, Telegraph Inspector from Bergen, Norway.

The new lighting arrangements in the Instrument Room have been completed and have produced a very pleasing effect. One "illuminating" comment described the result as "being like Fairyland."

On May 9 Mr. J. J. Edwards, Asst. Engineer, Technical Section, Leeds, was presented with two framed sketches on the occasion of his transfer from the N.E. Engineering District to the Engineer-in-Chief's Office, London. Mr. J. W. Atkinson, Superintending Engineer, in making the presentation, remarked that although Mr. Edwards had been in the district for a comparatively short period he had proved a zealous officer and endeared himself to all. He extended to Mr. Edwards the best wishes of his colleagues for success in his new sphere.

Miss Edith (Sally) Lunn, Writing Assistant, Leeds, was presented by her colleagues in the Accounts Section of the District Office with an oak clock and cut glass cheese dish, on her retirement to be married. Miss Lunn was very popular with the staff, and their best wishes for her future happiness in her new sphere were suitably conveyed to her.

One of our trainees has returned to the fold in the person of Mr. Gerald Ross, Asst. Traffic Superintendent, who has been transferred from Manchester, and to whom we offer a hearty welcome—and plenty of hard work.

In common with many sporting events this year the wind and rain played havoc with the Leeds Civil Service Golfing Society's Spring Meeting. We offer our tribute to the hardihood of those who braved the elements, but we ourselves have not the hardihood to publish their scores. We hope to have better luck with the Autumn Meeting, which takes place on the famous Moortown course in September.

The vexation and disbelief with which persistent but unfortunate callers usually receive "number engaged" reports prompts us to record with pleasure that one of our subscribers dialled 91 and apologised for his earlier "crossness," as he had discovered that reports, covering a period of half an hour, that the number he wanted was engaged, were correct. He has come to the conclusion that the operating staff do their best to satisfy subscribers.

At a very small scale payment office a travelling officer had occasion to enquire why the telephone directory in the Call Office Cabinet was out of date. With pride the Postmistress produced the current directory from a drawer and explained that she wanted to keep it clean and tidy.

It is apparent that in spite of the care which is exercised, the wording of official publications is not always free from a certain ambiguity. A caller at a Leeds kiosk the other day asked that a short distance trunk call he was making should be debited to "Gerrard" When informed that this could not be done he replied in a distinctly aggrieved tone that he had in front of him a leaflet which said "You can now book your trunk calls to any person you want."

This month's reflection by the Asst. Traffic Superintendent in training:—

"The worst thing about knowledge is that it can only be acquired on the instalment system."

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

By HARRY G. SELLARS.

Continued from page 192.

- 1915, April ... Name of Betulander Automatic Telephone Company changed to the Relay Automatic Telephone Company.
E. Kleinschmidt introduced a keyboard tape perforator with a selective method of punching, in which an electromagnet performed the necessary operation.
- 1915, May ... Taccani, of Benevento, invented a telegraph transmitter which stored 80 letters.
Yetman devised a transmitting typewriter.
- 1915, May ... Piersen invented a transmitter for morse signals, which stored 71 letters.
E. Kleinschmidt devised a transmitter for the five-unit alphabet which stored about 25 letters.
- 1915, June ... G. A. Campbell and Karl Willy Wagner invented "frequency band filters" for wireless working.
William Aitken patented a method of multi-choice access, or graded access, in connexion with automatic telephony.
- 1915, July ... Satisfactory repeater produced for long-distance telephony.
J. E. Kingsbury published "The Telephone and Telephone Exchanges."
Telephone repeaters used on a cable between New York and Washington.
E. E. Fournier d'Albe invented the Optophone which enables blind persons to read typed letters by means of sound.
Brown devised the Phonopticon which enables blind persons to read by sound.
A. O. Rankine invented an apparatus for transmitting speech by means of rays of light.
- 1915, Sept. 6... Surcharge introduced for all new telephone services with a view to reducing applications (European war in progress).
- 1915, Sept. 21 Committee on Retrenchment of the Public Expenditure issued its first report. All-round increase of postal charges recommended.
- 1915, Oct. 1 ... Telephone trunk charges increased by one-third and rates for unlimited exchange service in London and the provinces raised from £17 and £10 to £20 and £12, respectively.
Transatlantic radio-telephony tests carried out by the American Telephone and Telegraph Company, and the International Western Electric Company.
- 1915, Dec. 15 London—Halifax, N.S., cable interrupted.
Loss of £118,177 on the telephone service.
- 1916, Jan. 17... Dungeness—Griz Nez cable laid.
- 1916, Jan. 25... G. C. Marris suggested that it might be possible to send out five printing signals on one segment of a distributor and to separate them at the distant end by means of tuned circuits. Le Faivre, of France, conceived the same idea and H. H. Harrison carried out researches in the direction indicated.
- 1916, Feb. 14... Telephone communication established between Montreal and Vancouver—via Chicago, Portland and Seattle—a distance of 4,000 miles.
- 1916, Mar. 27 Great storm in the United Kingdom wrecked 41,500 telephone poles and 17,000 miles of wire.
Underground "loaded" telephone cable between London and Liverpool completed.
- 1916, Mar. 31 Post Office surplus during previous 12 months £5,366,424.
Difference in longitude between Washington and Paris determined by means of wireless telegraphy.
Senatore Marconi experimented in short wave directional wireless with damped waves of two or three metres.
- 1916, April ... Marius Latour (France) introduced a "choke coil" for use in wireless telephony.
Telegraph Money Order service extended to West Indies, South Africa, Malay States, Ceylon, Mauritius, &c.

- Radio-telegraphic duplex communication established between Clifden, Ireland, and Louisberg, Cape Breton, utilising Wheatstone transmitters and dictaphone receivers.
- 1916, Aug. ... H. H. Harrison calculated the transit time of a relay tongue with various currents and with varying "play" between the contacts.
(Devaux-Charbonnee, of France, calculated the transit time of a relay tongue with varying currents. He also assessed the constant capacity and inductance of overhead copper lines per unit length and investigated the working capabilities of circuits.)
H. H. Harrison and S. R. Smith introduced a start-stop telegraph system in which the duplex balance is not required.
Western Electric type-keyboard page-printing multiplex (based on Donald Murray's system) installed on London—Manchester telegraph lines.
Letter postage rate increased to one penny for one ounce.
Profit of £201,729 on the telephone service.
- 1917, Jan. ... Telegraph Money Order system extended to Borneo, Aden, India, &c.
Office copies of delivered telegrams abolished in provincial offices.
- 1917, Mar. 31 Post Office surplus during previous 12 months £6,191,501.
- 1917, April 1... Telephone junction service inaugurated between Edinburgh and Glasgow.
Committee on high-speed telegraphy reported. They concluded that five-unit, automatic, multiplex printing telegraphs are preferable to Wheatstone automatic for inland working.
Telephone line opened between Montreal and Vancouver.
Vacuum tube amplifier with three electrodes installed at Lyons on Paris-Marseilles telephone circuit.
- 1917, July 17... Bomb dropped by enemy aircraft struck Central Telegraph Office, London.
- 1917, July 18... New London—Halifax Nova Scotia cable (purchased from Direct United States Company) opened for traffic.
- 1917, Aug. 4 ... Transatlantic wireless service suspended.
- 1917, Sept. 6... Cuckmere-Havre cable laid.
- 1917, Dec. 15 London—Halifax N.S. cable interrupted.
- 1918, Mar. 31 Post Office surplus during previous 12 months £6,647,423.
- 1918, May 15... Franklin medal presented to G. Marconi.
- 1918, May 18... Leeds automatic telephone exchange opened.
- 1918, Sept. 14 Siemens Brothers automatic telephone system put into service at Grimsby.
M. Balsera devised a printing telegraph apparatus combining the keyboard of the Hughes with the segmented distributor and receiving typewheel of the Baudot.
Wireless telephone messages transmitted from Carnarvon, Wales, to Sydney, Australia.
- 1918, Dec. 31... 9,000,000 telegrams accepted by telephone and 8,000,000 delivered by telephone in Great Britain during the year.
3,026 telephone exchanges in United Kingdom.
81,000 foreign and colonial telegraph money orders dealt with during the year.
Letter postage rate increased to three halfpence for one ounce.
- 1919, Jan. 14... Conference of Telegraph supervising officers held at the General Post Office, London. Mr. R. A. Dalzell presided.
- 1919, Feb. 5 ... London—Halifax cable (via Fayal) restored.
Multiplex system of combined telephone and telegraph working introduced on Baltimore—Pittsburgh circuits.
- 1919, Mar. 1 ... Speech transmitted without wires between Ballybunion, Ireland and Louisberg, Nova Scotia. Thermionic generating valves were used.
- 1919, Mar. 31 Post Office surplus during previous 12 months £7,447,556.
- 1919, April 4... Sir William Crookes died.
- 1919, April 15 First Anglo-German telegraph communication (London—Cologne) re-opened after the Great War.
- 1919, April 16 London—Antwerp communication re-opened, via Amsterdam.
- 1919, April 18 London—Brussels communication re-opened via Calais and Dunkirk.

(To be continued.)

RESULTS OF POSTS.	1916, Aug. ...	Radio-telegraphic duplex communication established between Clifden, Ireland, and Louisberg, Cape Breton, utilising Wheatstone transmitters and dictaphone receivers.
Company Company.	...	H. H. Harrison calculated the transit time of a relay tongue with various currents and with varying "play" between the contacts.
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London	...	Leeds automatic telephone exchange opened.
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Indies, &c.	...	9,000,000 telegrams accepted by telephone and 8,000,000 delivered by telephone in Great Britain during the year.

(To be continued.)

THE
Telegraph and Telephone Journal.

VOL. XVII. AUGUST, 1931. No. 197.

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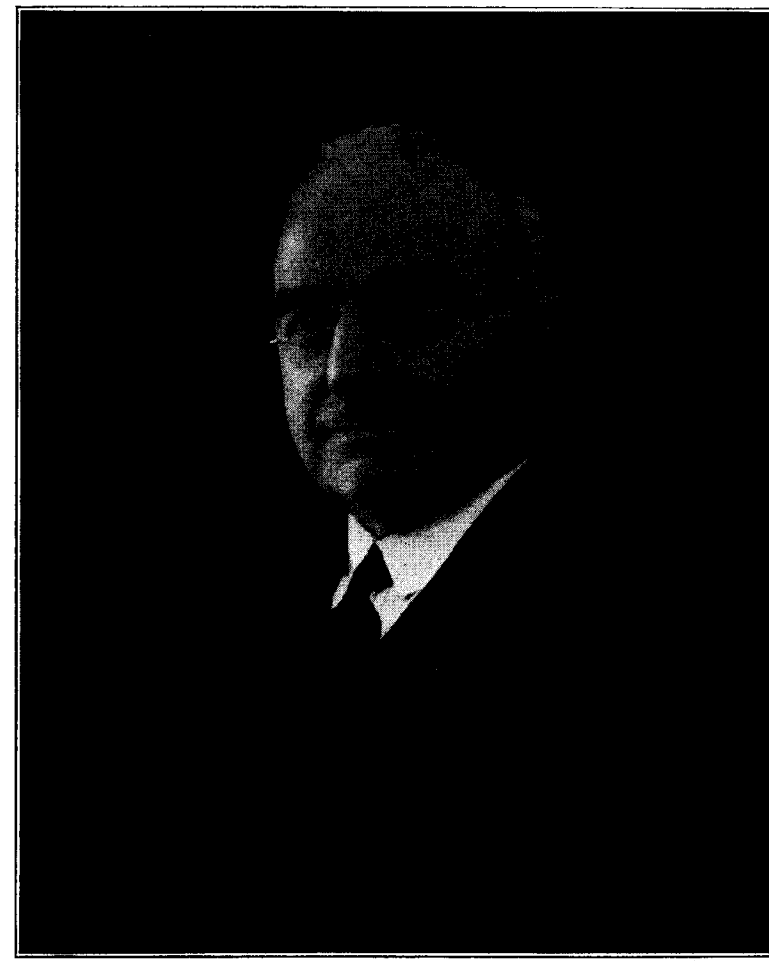
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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXXIX.

MR. A. W. SIRETT.

MR. A. W. SIRETT, who retired from the Postmaster-Surveyorship of Sheffield on June 2 last, got his first established appointment as a Sorting Clerk and Telegraphist at Oxford nearly 43 years ago. He spent twelve years in the rank and file before he received promotion in his own office, but this was followed a year later by promotion to an Assistant Superintendentship, Class II, at Coventry. After eight years at Coventry (where he was in the meantime promoted to Class I Assistant



[Photograph by Yates & Henderson, Sheffield.]

Superintendent) he was promoted to the Superintendentship at Cambridge, and then followed a series of rapid promotions, viz., to Sheffield (as Assistant Postmaster) in 1914, Northampton (as Postmaster) in 1918, Chester in 1920, Portsmouth and Gosport (for a period of 16 days) in 1922, then Nottingham, and finally back to Sheffield as Postmaster-Surveyor in 1926.
Anyone who came into contact with Mr. Sirett could not fail to be impressed by his extraordinary grasp of Post Office services. He is a charming companion, and all his friends wish him every happiness in his retirement.

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - -	{	Lieut.-Col. A. A. JAYNE.
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		J. W. WISSENDEN.
Managing Editor - -		W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVII.

AUGUST, 1931.

No. 197.

TELEPHONE CHARGES.

THE article published last month on the question of telephone charges has produced a letter, which we publish in this issue, from the author of the original letter in the *Daily Telegraph*, advocating a uniform charge for all calls. Our article last month was directed not merely against this particular scheme, but also against various other schemes propounded from time to time, including the abolition of rentals, and in so far as this writer's scheme visualises retention of a rental in addition to a charge per call, it is not open to some of the criticisms mentioned in our previous article.

The figures, however, which he produces in his present letter in support of his scheme for a uniform charge of 1d. per 3 minutes for all calls, are open to grave criticism; and it is also clear that he has not the slightest idea of the intricate problems and difficulties involved in the provision of long-distance telephone service, both on the plant side and on the operating side. (He might with advantage, from this point of view, peruse the articles which have been appearing in several of our recent issues on the provision of long-distance service.) He assumes that because 1,325,000,000 calls at approximately 1d. each per 3 minutes, and 120,000,000 trunk calls at varying amounts up to 4s. 6d. each per 3 minutes, together produce revenue which works out at perhaps 2d. per call per 3 minutes on the average, and because the service can pay on that basis, therefore the relationship between the number of local and of trunk calls could be varied at will and all calls could be charged at a uniform fee of 1d. each per 3 minutes, without

affecting the cost of operation. Truly a wonderful assumption—even if one were to make the uniform fee the present average 2d. per call, instead of 1d. One might as well urge that a shop which sells 120 1d. cakes a day and 12 1s. cakes (an average of 2d. per cake), could expect to keep its doors open if its proprietor announced that in future both sizes of cake in unlimited numbers would be on sale at 1d. (or even at 2d.) each, and that he confidently anticipated that increased sales would maintain the business in a flourishing condition. The man would, of course, be bankrupt in a few hours, owing to the vastly increased demand for 1s. cakes at 1d. or 2d. each; and meantime, if the charge were 2d., all the customers who did not like 1s. cakes and preferred the 1d. variety would have been shrieking because the cost of their favourites had gone up 100%. As our last month's article said, uniform call charges would ruin the telephone service, either by making local calls unjustifiably dear, or by making long-distance calls uneconomically cheap.

More could be said on other points in the letter, but the foregoing objection is so fundamental that there is no point in carrying the analysis of the scheme further. What our correspondent cannot see is that in the case of a letter the cost of transit between the point of origin and the point of destination is of very small importance in relation to the other costs involved in dealing with it; whereas in the case of a telephone call the distance is a very vital factor in the costs of handling.

It is interesting to note that our correspondent's similar scheme for the railways has not yet secured the approbation of the hard-headed business men who are responsible for running those concerns, though it was promulgated in 1913; nor have we observed any enthusiasm for such a scheme on the part of bus companies.

NINE YEARS' ACHIEVEMENT IN INTERNATIONAL TELEPHONY.

It is worthy of record that during the current year the hundredth "through" Anglo-Continental telephone circuit was brought into use. There are at present actually 108 of these circuits working. When it is remembered that exactly nine years ago from the time of writing (just before the first Anglo-Dutch circuit was opened for service in August 1922), the only channels of telephonic communication between this country and the mainland of Europe were the 23 circuits to Northern France and Belgium, it will be realised what a transformation in Anglo-European communication has gradually and almost imperceptibly taken place in that short period. Instead of being practically limited as formerly to communication with Brussels, Antwerp, Paris, Lille, Boulogne, and Calais (with undependable connexions with Marseilles and Switzerland), the British telephone subscriber can now speak to every country in Europe with the exception of Russia and some of the Balkan States. The more easterly States are afforded a "switched" service via exchanges in Germany, Austria, or Hungary, but the majority of countries are served by the "through" circuits referred

to. As many as 36 circuits connect England with France; 23 with Germany; 15 with Holland; 14 with Belgium; 7 with Switzerland; 3 with Spain; 3 with Sweden; 2 with Italy; and one each with Austria, Hungary, Czecho-Slovakia, Denmark, and Norway. 31 through circuits terminate in Paris alone, 9 in Berlin, 7 in Hamburg, 9 in Amsterdam, and 8 in Brussels. They are not confined to carrying traffic between capitals, but also serve such places as Marseilles, Barcelona, Milan, Zurich, Cologne, Malmo, and Frankfurt-on-Main. The Anglo-Continental services in general, moreover, have during this nine years become incomparably more rapid and reliable, and are well established in public favour.

We in this country do not, of course, claim sole credit for these far-reaching and important developments. The submarine cables employed are, as is generally known, laid at the joint cost of the British Post Office and the foreign administrations concerned. Six of these have been laid during the period under review, including 3 cables to Holland, one additional cable to France and two to Belgium. Above all, due recognition must be given to the fruitful and patient labours of the C.C.I. and the ready co-operation afforded through this body by the administrative and technical experts of all the great European administrations. The benefits obtained by the institution of this international Committee have been incalculable, and there is no question that the results attained could scarcely have been reached without its aid. The nine years under review, moreover, have been rendered still more noteworthy by the establishment of the Transatlantic and Anglo-Australian radio-telephone services, which were soon extended to all the principal countries of Europe. What this achievement of placing nine-tenths of the telephone-using inhabitants of the world in communication with one another signifies for culture, commerce, and civilisation, it is impossible to gauge. Only the future can disclose the full benefits which the availability of rapid and reliable means of speech between nation and nation in times of urgency has conferred on mankind at large.

HIC ET UBIQUE.

On July 23, a radiotelephone service was inaugurated between all parts of Great Britain and Northern Ireland and all parts of New Zealand.

Service at present is available between 4 a.m. to 8.30 a.m. and 7.30 p.m. to 11.30 p.m. except on Saturday evenings and on Sundays.

The charge for a call to any place in New Zealand is £2 5s. 0d. a minute (minimum charge, £6 15s. 0d. for 3 minutes).

As the transmitting radio station in New Zealand is not sufficiently powerful to communicate directly with this country, calls in the new service will be set up by connecting (at Sydney) the radiotelephone circuit between Great Britain and Australia and that between Australia and New Zealand.

Telephone service was opened last month between this country and Sardinia. For the present the service will be available only between London and the towns of Cagliari, Nuoro, Ozieri, and Sassari.

The charge for a 3-minute day call from London is 16s. 6d.

A daily paper learns that there are only about six different formulæ that may be used by American telephone operators when they talk to subscribers.

They may say "Number, please?" "Your line busy," "I'll call you," and make one or two other routine remarks—but that is all.

Truly this is an age of discovery!

A correspondent sends us the following:—

WANTED TO KNOW—OR QUESTIONS TO BE ANSWERED.

1. What is a phantom circuit?

2. What is a double phantom circuit?

3. When communication is given over a 'phantom circuit,' would it be correct to describe that communication as a 'phantom communication'? If so, what term would you give to the communication over a 'double phantom circuit'?

4. When communication is given over a phantom circuit is it justifiable to make more than a phantom charge? What should be the charge for a 'double phantom circuit'?

5. Would it be justifiable to term the engineers who are responsible for the naming of phantom circuits as 'phantom engineers'? What would you term the engineer who was responsible for the naming of a circuit as 'double phantom'?

Our correspondent suggests that as the answers to the above questions may be of use to students proposing to sit at future examinations by the City and Guilds of London, also to young engineers and traffic officers, the questions call for considered replies.

GHOSTS.

Ghosts have their place in these blood-curdling stories,
Which share with Gunmen in the latest glories
Of our astute best-sellers, who well know
How very far a "Nameless Thing" will go
To work upon weak minds with bedside fears.
But what have Ghosts to do with Engineers,
Or "Phantoms" with hard-headed Scientists?
Superimpose on wires let him who lists,
But not upon our English tongue. Vague terms
Turn on their users like ill-treated worms.
Are "phantom" lines by ghostly linemen run,
Designed by "phantom" engineers who shun,
Like goblins damn'd, the honest light of day,
And, *bien entendu*, work for phantom pay?
And will the public pay for calls that be
Routed o'er phantom lines—a phantom fee?

W. H. G.

RADIO-AT-A-GLANCE.

MESSRS. FRANK PITCHFORD & Co., LTD., have just brought out an ingenious and reasonably priced device in the form of a double-sided wheel which, as its title indicates, gives at a glance nine very important facts in relation to each of 76 of the most important British and Continental radio stations.

By the simple process of pointing an arrow to the station required, you are given at a glance the distance from London—interval signal—frequency—power—comparative difference in time on London—wavelengths—call sign and the closing down announcement for each station.

It is very attractively got up, being printed in colours and is a record always at hand. It is on sale at all wireless suppliers, bookstalls and stations—price 1s. each.

The same firm have sent us a specimen of their "Solar time at a glance," another wheel-shaped cardboard device, which on being rotated will show the exact time in any country, and can be employed to tune in for any radio station, or to time outward telephone calls to foreign countries. This is an equally ingenious and useful device.

THE CHARACTERISTICS OF RADIO COMMUNICATION.*

By A. J. GILL.

(Continued from page 226.)

CHARACTERISTICS OF LONG WAVE AND SHORT WAVE SYSTEMS.

As an introduction to this subject, it may be useful to say a few words about the development of radio practice in the last few years. Prior to about 1921, practically all radio transmission was carried out on wavelengths greater than 100 metres. Before the invention of the three electrode thermionic valve, the production of waves of this order was only possible by means of spark apparatus, and the most sensitive method of reception was by means of a crystal detector. With spark apparatus the power that can be developed in a transmitter is governed by the wavelength, and it was therefore necessary to use longer wavelengths with higher powers. It was also known that for equal radiated power a long wave had a greater range than a shorter one. Unfortunately, as we increase the wavelength the radiating efficiency of the aerial decreases. For example, with a given aerial, if we double the wavelength we must put four times the current into the aerial to get the same initial radiation, which means that we should require about sixteen times the power. The radiation can be increased by increasing the height of the aerial, and in practice a compromise is effected, that is to say, as the required range of a station is increased, we increase the wavelength, the size of the aerial, and the power. This involves a rapid increase in the cost of the station.

This practice continued with improved types of transmitters such as arcs, alternators and valve sets working on continuous waves and culminated in the construction of super power stations, such as Nauen, Bordeaux, Rocky Point, Rugby, and Bandoeng, capable of world-wide communication. With the development of valve transmitters and receivers after the war it became possible to produce efficient apparatus for waves below 100 metres, and it was then discovered that these short waves had remarkable transmission properties, and that phenomenal ranges could be obtained with quite limited powers. This gave a great stimulus to radio engineering, and all interests rushed in to develop this new system of communication. One of the first commercial services to operate was between Dollis Hill and Halifax, Nova Scotia, which opened in July, 1925, as an auxiliary to the long wave press service from Leafeld. This was followed by the Marconi short wave Beam services to the colonies. Similar developments took place in other countries, and by the end of 1927 it became necessary at the Washington Conference, held then to divide up all wavelengths down to 6 metres, into bands which were allocated to various classes of services such as fixed services, mobile services, broadcasting and experimental. The value of these short waves has been so universally recognised, that at the present time the more useful bands are becoming severely congested, and it is a matter of difficulty to obtain waves for new stations and to avoid interference between existing ones.

In considering the most suitable wavelength to be used for any particular service, it is necessary to take account of a large number of factors. A few of the more important are the distance and actual path of the service; the type of service, whether between two fixed stations or to a number of stations in a given area, such as a broadcast service; whether a service must be workable through the 24 hours or whether a limited service would suffice; and finally, whether the service is to be for telegraphy or for telephony.

The path is important as its nature has great influence on the rate of decay of the direct ray. Transmission over sea suffers much less loss than transmission over land, and transmission over flat country suffers less than transmission over mountainous country. The nature of the service, whether fixed or otherwise, determines to some degree whether directional methods can be used. The hours of service are of importance, as sometimes short waves can only provide a channel for a limited number of hours a day, while the question of telegraphy or telephony has a very important bearing on wavelength in the following way. Telephony on a given wavelength and over a given range requires higher power than telegraphy, and it also requires a much wider band of frequencies. The wide band makes it impracticable to use the most suitable long wavelength in the case of ranges exceeding about 4,000 miles, and as a result this represents the economic limit for long wave telephony in the present state of the art.

For ranges below about 1,000 miles, short waves possess little or no advantage over long waves, but for long ranges short waves are serious competitors with the long waves, and it will be useful to compare their characteristics on that basis.

In long wave transmission the predominating factor is the direct ray. There is a certain amount of indirect ray, but this does not play a large part.

On any particular path long wave signals generally behave consistently throughout the twenty-four hours and throughout the year. There is usually a slight annual variation and signals are generally lower in the summer and higher in the winter.

Fig. 1 shows the signal strength of Rugby measured by the Bureau of Standards at Washington for a number of years. The values are the monthly averages of daily readings. Long wave signals are generally unaffected at times of magnetic storms.

Much of our information on long wave transmission is obtained from the transatlantic telephone circuit working on 60,000 cycles per sec. (5,000 metres), as systematic observations and measurements are taken regularly on this circuit.

Short wave signals, on the other hand, cannot be relied on to remain steady for even a minute at a time. During portions of the day it often becomes impossible to communicate at all on short waves, and in most cases it is necessary to change the wave once or twice during the 24 hours, so that it is usual to provide a short wave transmitter with means for working on at least three different waves. Generally speaking, waves of from 13 to 16 metres have the greatest effective range over daylight paths, and waves of from 24 to 40 metres are most effective on dark or partially dark paths.

Short waves are particularly vulnerable to that type of cosmic activity which also gives rise to magnetic storms. At such times it is not uncommon for short wave communication to break down completely for a number of days at a time. The efficiency of any radio circuit, whether long or short wave, depends on the ratio of signal to noise in the output of the receiver. To ensure a workable circuit on telegraphy or telephony, the signal voltage should be at least about three times the value of the voltage due to noise. The noise may be due to natural disturbances known as atmospherics, or may arise from electrical machinery near the receiver, or may be produced in the receiver itself, due to the use of excessive amplification.

Signal fields for Bordeaux & Rugby (GBR) at Washington 1900-1930

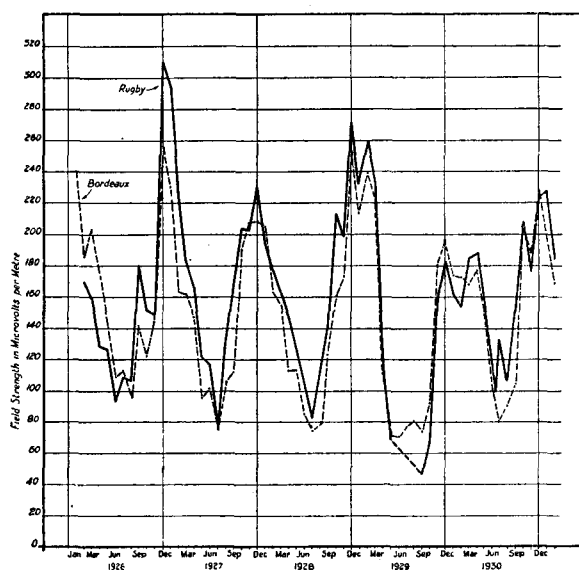


FIG. 1.

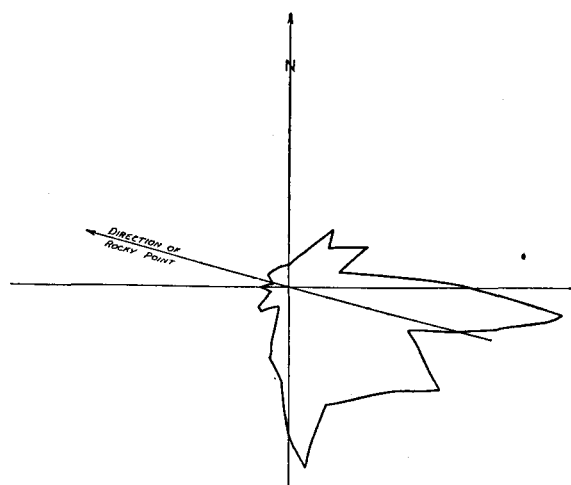
In some parts of the world, notably in the tropics, noise from atmospherics assumes such large values that long wave reception becomes extremely difficult and frequently impossible during certain times of the day and during certain seasons of the year. Noise is not equally distributed on all waves but is stronger on the longer waves and becomes less and less as the waves get shorter and shorter. In consequence, the higher proportion of noise offsets to some extent the advantages of consistency which long waves possess and renders them less suitable than short waves for reception in the tropics.

The effect of atmospherics can be reduced in two ways, firstly, by limiting the band of frequencies accepted by the receiver to those essential to the service, and secondly, by limiting the direction from which signals are received to that of the desired signal. In the case of the long wave transatlantic telephone circuit, reception at Cupar, Fife, is carried out on sixteen aerials, eight being vertical wires and eight being frame aerials. The signals from these aerials are combined in such a manner that reception is limited to signals arriving within a very narrow angle. In this way the voltage from atmospherics is reduced to less than a tenth of the value that would be received on a simple vertical aerial. Fortunately the atmospherics in the direction of the signal are small compared with those arriving in other directions, so that the benefits accruing from the directional system are correspondingly greater. Fig. 2 shows the relative directional distribution of atmospherics at Cupar.

It is possible to increase the effectiveness of a transmitting station by directional transmission. In order to achieve this it is necessary to use two or more aerials, the more the better, and to space them some distance apart. The distance between the aerials should be of the order of a half wavelength. For this reason the use of directional transmission on long waves becomes very costly, and this prevents its possibilities being fully developed. On the shorter waves below 100 metres, directional transmission and reception offers great advantages, as the aerial systems can be constructed comparatively cheaply. A well constructed aerial will produce a concentration in the forward direction equal to that from a simple aerial supplied with 100 times the power, and the cost of such an aerial would only amount to about $\frac{1}{4}$ to $\frac{1}{5}$ of the cost of the transmitter. As a result, it is general practice to utilise such aerial systems in transmission and reception on short waves.

* Paper read before the Telephone and Telegraph Society of London.

The use of directional aerials for reception is also beneficial in reducing the effects of fading, as it is equivalent to using upwards of fifty aerials simultaneously. The effects of fading can also be reduced by appropriate devices in the receiver. In telegraph receivers it is usual to set the gain of the receiver to a value at which the minimum signal operates the recorder. As the signals increase from this value the operating current is limited by overloading in the receiver. This method cannot be used for telephony as serious distortion would arise, and the most satisfactory scheme is one



DIRECTIONAL DISTRIBUTION OF ATMOSPHERICS
AT CUPAR DEC 1928 - JULY 1929

FIG. 2.

which utilises the incoming carrier wave to control automatically the amplification or gain of the receiver. This can be done very successfully, and changes of upwards of a million times in the power of the incoming signal produce a scarcely perceptible variation in the output from the receiver. These tremendous changes in amplification cause corresponding variations in the noise, and it is characteristic with such equipment at times of heavy fading to hear a background of subdued roaring which rises and falls like the noise of the wind or of the surf on the seashore.

Troubles from echoes sometimes occur in telegraphy. The echo signals are lower in value than the direct signals but owing to the action of the limiter they are equally effective in operating the recorder. The remedy lies in reducing the amplification of the receiver until only the direct signal operates the recorder or, alternatively, to reduce the power of the transmitter until the echo signals cease to be received. The automatic gain control on a telephone receiver eliminates the effects of echoes as at such times the strong direct signal reduces the gain of the receiver to such a low value that the comparatively weak echoes are unheard.

Before leaving this subject it may be of interest to mention one other problem which arises, namely, the accurate control of frequency at transmitting stations. International recommendations have laid down certain standards to be adhered to in order to prevent interference between services. Long wave fixed stations should maintain their frequency to within 1 part in 1,000 and short wave stations to within 1 in 10,000. The Post Office long wave stations are among the most precisely controlled in the world. They use a system developed in the department by which a metal tuning fork maintained in vibration by electrical means controls the frequency of the transmitter. On short waves the difficulty of control is greater and the precision of control required is higher. The systems in use have not yet reached the final stage of development, but at the present time it is possible to maintain a constancy of from 1 part in 10,000 to 1 part in 100,000, and it seems probable that in the near future it will be possible to extend this to 1 part in a million. One of the most satisfactory systems of control uses as the source of frequency a small piece of quartz or rock crystal which is electrically maintained in vibration. The crystal vibrates at about three million times a second and multiples of this frequency up to about 24 millions a second are used to control the transmitter. In order to get the high degree of constancy it is necessary to keep the crystal at a temperature which is steady to within 1/10th of a degree.

In conclusion, I should like to say a few words about very short waves, that is waves below 10 metres in length. These waves appear to behave very much like light waves. They are not reflected by the Heaviside layer so that they are only suitable for short ranges, and there should be a clear optical path between transmitter and receiver. There is such an enormous range of frequencies available on these waves that there is practically no limit to the number of services they could carry, and of late a good deal of attention has been directed to studying their characteristics. They seem to be particularly suitable for telegraph or telephone links across short sea routes or across tidal estuaries, and the radio section has recently carried out tests on telephony across the mouth of the Thames, using waves of 3 and 5 metres.

Still more recently the Standard Telephone Company has demonstrated an experimental two-way channel between Dover and Calais, using the

exceptionally short wavelength of 15 cm.—about 6 in. Large aluminium reflectors are used to direct the rays at the transmitter and to concentrate them at the receiver, the transmitting and receiving aerials being short pieces of wire about an inch in length at the focus of the respective reflectors.

Hemispherical copper reflectors are used to prevent direct radiation. It is claimed that the reflectors give an improvement of 52 decibels, that is a power multiplication of 160,000 times; this seems reasonable, as it is about what can be obtained with directional aerials between 10 and 20 metres. With this equipment, using low powers of the order of a few watts, a telephone circuit is provided which is of good intelligibility and which seems to be exceptionally stable.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at May 31 was 1,994,847, representing a net increase of 9,088 on the total at the end of the previous month. (During June the two-million point was passed.)

The growth for the month of May is summarised below:—

Telephone Stations—	London.	Provinces.
Total at May 31, 1931	717,001	1,277,846
Net increase	2,788	6,300
Residence Rate Subscribers—		
Total	183,483	285,366
Net increase	1,031	1,718
Call Office Stations (including Kiosks)—		
Total	7,063	28,188
Net increase	97	231
Kiosks—		
Total	2,398	8,351
Net increase	61	217
Rural Railway Stations connected with Exchange System—		
Total	17	1,985
Net increase	—	15

The total number of inland trunk calls originated during the year ended Mar. 31, 1931, was 121,669,598, representing an increase of 4,539,385, or 4% over the total for the previous twelve months. Outgoing international calls for the year numbered 545,037 and incoming international calls 585,172, as compared with 535,977 and 581,831 respectively for the year 1929/30.

Further progress was made during the month of June with the development of the local exchange system. New exchanges opened included the following:—

PROVINCES—Ballyclare (Belfast), Beckermert (Cumberland), Benson (Wallingford), Birdham (Brighton), Bracklesham Bay (Chichester), Bradwell Moor (Hope), Buckland Newton (Dorchester), Cortachy (Kirkcubright), Crumlin (Belfast), Fintry (Balfour), Flockton (Dewsbury), Gamston (Retford), Glaisdale (Whitby), Groomsport (Bangor, Ireland), Handley (Salisbury), Harston (Cambridge), Hellingly (Hailsham), Kentmere (Kendal), Laggan (Kingussie), Llanfihangel Ystrad (S. Wales), Lydiat (Maghull), Lyne of Skene (Aberdeen), Marton Heath (Chester), Newsholme (Selby), Northleach (Cheltenham), North Rode (Macclesfield), Paxton (Newcastle-on-Tyne), Stottesdon (Bridgnorth), Upper Basildon (Pangbourne), Whixall (Whitchurch, Salop), Whorlton (Barnard Castle) (all rural automatic); Blackfriars (Manchester), Cheriton, Folkestone, Hythe, Sandgate, Lydinge, King's Langley, Radlett, Watford (all automatic);

and among the more important exchanges extended were:—

PROVINCES—Cleveleys, Redditch.

During the month the following additions to the main underground system were completed and brought into use:—

Edinburgh—Haddington,

Glasgow—Ayr,

Liverpool—Rhyll (section of Liverpool—Colwyn Bay Cable),

while 73 new overhead trunk circuits were completed, and 75 additional circuits were provided by means of spare wires in underground cables.

LONG DISTANCE TELEPHONY.

J. F. DARBY (*Headquarters Traffic Section*).

(IX.)

IN concluding this series of articles on long distance telephony, it is desired to recall the statement, made in the first article, of the object in view—to demonstrate the means by which the efficiency of long distance working can be improved. Attention was directed to three aspects, viz., improved operating methods, technical aids and better organisation; the first two points have been dealt with and it is proposed, now, to consider the question of organisation. This question concerns all aspects of the system—line plant layout, routing and control, operating procedure and switchroom management.

LINE PLANT LAYOUT ORGANISATION.

An investigation of the principles followed by the various telephone administrations shows that, in practically all cases, organisation in this connexion is being carried out on parallel lines.

The basic principle involved is that three classes of trunk switching centres are provided and the routing of traffic is organised in order to regulate the number of switchings and control the attenuation losses on any connexion set up on the system.

Broadly speaking, the three types of centres may be regarded as *terminal*, *intermediate* and *main*, from a trunk switching point of view. The *terminal* centre corresponds to the *group* centre in Great Britain—it is known in America, Germany and France as a Toll, Terminal and Group Centre respectively. Each centre may be considered a "collecting" point for long distance traffic for a given area ('group' area) and to this centre are connected the local and minor exchanges within the area. The aim is to connect each of these exchanges direct to a terminal trunk centre, but in Great Britain, and indeed other countries, this cannot be attained at present, and some local and minor exchanges may continue for some time to gain access to their terminal trunk exchange (group centre) via an intermediate local exchange. This situation arises mainly from the provision of telephones in scattered and isolated districts, where long distances are involved between the minor exchanges and the group centre, and the amount of the long distance traffic is too small to make the provision of direct circuits to the group centre remunerative. This is particularly the case in areas such as the Aberdeen and Scotland West Districts, where the villages are often miles apart and island communications are in some instances involved.

In France the problem of the connexion of rural exchanges to the terminal trunk exchange (group centre) via an intermediate exchange is being dealt with by provision of automatic exchange switching at intermediate points so that the terminal trunk exchange can obtain direct access to the required local or minor exchange without the assistance of an intermediate operator. As regards Great Britain, the problem is being considered from three aspects—(i) formation of more group centres, (ii) automatic switching at intermediate sub-group centres and (iii) provision of cables (aerial or underground) to connect a group of subscribers at present on a minor exchange direct to an exchange with direct circuits to a group centre. In principle, each group centre is connected direct to at least one switching centre of a higher category—normally that of the intermediate class—and, in addition, within limited areas according to the density of the telephone traffic, group centres are connected direct with each other.

The *intermediate* class of switching centre corresponds to the provincial zone centre in Great Britain. (In America, it is known as a Primary Outlet, in France and Germany as a Distributing Centre.) Each of these exchanges acts as switching centre for a zone embracing a large number of the 'group' areas mentioned above and gives the (not directly connected) group centres within it access to one another. Within limited areas, intermediate switching centres are connected direct with each other. In Great Britain, with a few exceptions, all such centres (zone centres) are connected together with direct circuits. All intermediate centres have access to the next category of switching centre by means of direct circuits.

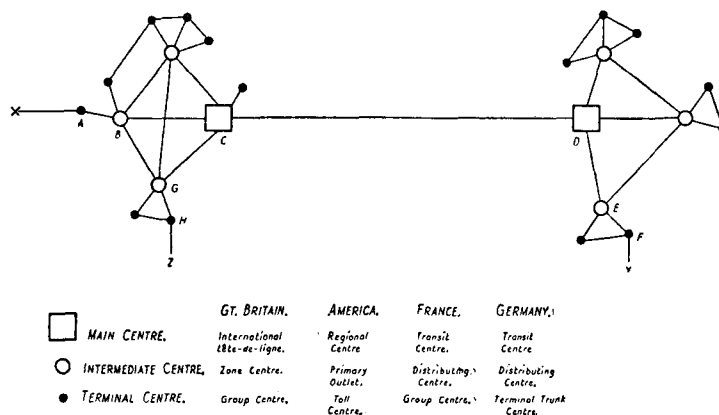
The *main* switching centres (called Regional Centres in America and Transit Centres in France and Germany) are placed at strategic points over a wide area. They are, as far as practicable, directly inter-connected themselves and serve either to provide connexion between the intermediate switching centres (sometimes via a second 'main' switching centre) where direct circuits do not exist, or as alternative routes. All intermediate switching points have direct circuits to at least one *main* switching centre.

The only exchange coming under this category in Great Britain is London in its rôle as an international *tête-de-ligne*. It serves as a switching point between zone centres in Great Britain, when required, and also for switching between British zone centres on one hand and overseas *main* switching centres, such as Berlin, Paris and New York, on the other hand.

Where the telephone area administered is extensive, a number of main switching centres is necessary. In America there are 8 of such centres and in Germany approximately 15—the number depends on various factors—the area involved, the telephone density of the country and the distribution of its large towns.

The switching system described above is given in outline in the accompanying diagram.

With such an organisation, it is possible, in the first place, for any one subscriber on the network to be connected with any other subscriber. Secondly, the number of switchings involved is limited; it should not be in excess of 6 for other than international calls and, in restricted areas with the zone centres directly inter-connected, as in the case of Great Britain, the number of switchings should not normally exceed 4. For example, a call from a local exchange at X to exchange Z (see diagram) would be switched at (i) group centre A, (ii) zone centre B, (iii) zone centre G and (iv) group centre H. If, however, a more extensive area is involved, say in the case of a system such as that in North America, and routing via *main* centres is necessary, the number of switchings may be 6—as an illustration—a call from X to Y (see diagram) would be routed via (i) group centre A, (ii) zone centre B, (iii) main centre C, (iv) main centre D, (v) zone centre E and (vi) group centre F.



Where international calls are concerned the number of switchings may be further increased, for example, a call from Kosel, in Germany, to Orange, in France, involves 8 switchings. The routing

would be (i) Kosel (group centre), (ii) Oppeln (zone centre), (iii) Breslau (main centre), (iv) Berlin (main centre), (v) Paris (main centre), (vi) Lyon (main centre), (vii) Valence (zone centre), (viii) Orange (group centre).

A third point in connexion with this switching scheme is that the transmission aspect on long distance calls can be safeguarded, since each link in the chain should have a certain transmission value, such that when the 'gain' obtained by the use of repeaters (cord circuit or terminal) is taken into account the overall attenuation is within the limit for satisfactory speech.

It will, of course, be appreciated that, for various reasons, this organisation has not been carried out in full either in Great Britain or abroad but that organisation is proceeding on the lines indicated. Until such organisation is complete, failures through poor transmission and multi-switched connexions will continue, from time to time, to occur.

The inter-connecting of switching centres of the same class, i.e., group to group and zone to zone, plays an important part in the building up of the long distance telephone network of a country—it provides for simple cross-country connexions, for the elimination of circuitous routings and facilities for alternative routings.

It may be of some interest to compare the areas embraced by the terminal trunk (group) centres in some of the principal countries. For the United States of America, Germany and Great Britain, the figures are approximately:—

Country.	Approx. No. of Group Centres.	Total Area in Square Miles (approx.).	Area per Group Centre. (Square Miles).
U.S.A.	2,500	3,000,000	1,200
Germany	700	182,000	260
Gt. Britain & N. Ireland	180	94,000	522
	(including new centres.)		

It will be seen that the size of the area covered by a group centre in Great Britain and Northern Ireland (when the new group centres are in operation) falls between that in America on the one hand and that for Germany on the other. An average area of 522 square miles covered by a group centre is equivalent to a square with sides of approximately 23 miles in length, and the distance from the group centre to the border of a square area of this size varies from 12 to 17 miles. In view of the fact that some 'group' areas will considerably exceed the average dimension, the distance from the group centre to the border of the area will be much in excess of the figures mentioned, in certain instances. These figures give, however, some indication of the distance involved in connexion with the problem of providing all local and minor exchanges in a 'group' area with direct circuits to their group centre.

CONTROL OF TRUNK TRAFFIC.

It has already been mentioned earlier in these articles that the control of inland long distance traffic under the demand system will be vested in the originating trunk centre, i.e., the group centre. An exception is where a zone centre is located at the group centre; in such cases the 'long distance' control for the 'group' area concerned will be undertaken at the zone centre. For outward overseas connexions, control will continue to pass to London as far as continental connexions are concerned. This transfer of control is necessary on account of the need for foreign language qualifications. In the case of overseas connexions set up over radio-channels, the practice has been adopted for the control of calls to be undertaken by the originating radio *tête-de-ligne*, i.e., the exchange (at the originating end) on which the radio channel in use is terminated. For example, a call from Birmingham to Chicago is controlled at London, a call from Liverpool to Siam

(routed via the radio channel between Berlin and Bangkok) will be controlled at Berlin when this service is in operation.

For connexions set up over radio channels in tandem, e.g., Australia to America via London, control as regards timing and allowances for disturbance due to atmospherics, &c., is again vested in the originating radio *tête-de-ligne*. The 'set-up' of the call, however, devolves mainly on the intermediate radio switching centre.

It seems a question, in connexion with *inter-continental* traffic which circulates almost wholly at present over radio channels, whether certain well defined points throughout the world should not be decided upon as control and routing centres, with a title to indicate a higher category of switching centre than the Regional centres of America or the Transit centres of Europe.

OPERATING PROCEDURE.

A standardised operating procedure for long distance telephony is, of course, an essential part of the system as it is of any form of business involving the routine handling of traffic. There are three salient aspects, compilation of the procedure, training of staff in the procedure and the execution or carrying out of the procedure.

The compilation of operating instructions falls naturally to the headquarters of the telephone organisation, and contemporaneously with the introduction of demand working a new procedure will be issued. It is not possible to deal in much detail at present with this particular aspect, but it may be mentioned, incidentally, that the opportunity of the changes in operating procedure will probably be taken to reduce the number of varieties of tickets in use to an absolute minimum and to extend the use of codes for indicating certain classes of information on tickets.

The recognised methods of training in operating procedure fall under the heading of school and switchroom tuition. Both these methods are essential, but the latter deserves more attention than is sometimes given to it; there will probably be considerable scope for it in connexion with introduction of the revised method of working. It will, of course, be essential to ensure that all operators—new entrants and seniors—are fully trained in connexion with new items, and the general practice in force of regular talks between the operating and supervising force will be helpful in this connexion.

As regards the carrying out of trunk operating procedure in practice, it is, of course, necessary for all supervising officers concerned to give close attention to day-to-day operating by patrol supervision, study of observation returns and scrutiny of tickets. The trunk service observations (particularly where the actual ticket records are associated with the observations) indicate the weak spots in operating, and much can be done by continuous concentration on defective items. Even in cases where standards are reached (some of our present standards were laid down when the service requirements were not so exacting as they are to-day), it is highly desirable that continuous improvement should be aimed at. In addition to the study of service observations, much good work can be done by the continuous review of results in connexion with the *average delay* on calls, both during the busy and slack periods of the day and night, output per circuit and the percentage of bookings which actually result in effective connexions. The scrutiny of tickets should indicate cases where timing procedure is not being correctly followed; neatness in the compilation of tickets is of real importance and needs constant attention. Further, from the study of call cancellations and complaints, weaknesses in connexion with organisation and operating can be detected; steps can then be taken to counteract these defects.

Mention may perhaps be made of the system in force in America under which a Central Office supervisor—an expert in long distance working—is assigned for the sole purpose of training within the switchroom.

This supervisor observes, say, for half an hour, the calls made by one operator, keeping in touch with each call throughout and making notes on the handling of the connexion. The operator is then withdrawn from the switchboard and the Central Office supervisor discusses with her the various aspects of the operating involved, and explains the methods for meeting any difficulties or defects which have arisen. With this arrangement, which it is made clear is purely for educational purposes, a high standard of operating is maintained, besides uniformity of practice and co-ordination of ideas being attained.

SWITCHROOM MANAGEMENT.

The first essential of good switchroom management is to put the right officer in charge. Experience shows that with an officer-in-charge of the right personality and possessing organising ability the results obtained are outstanding as regards quality. The same comments are applicable, although to a less degree, in connexion with the choice of the subordinate supervising staff and, in the development of our long distance system, the choice of the right personnel has a very important bearing. Where more than one service is undertaken in the same building, it is desired to segregate, as far as possible, the responsibility for the different services involved. There is much to be said in favour of giving an officer one undertaking for which he is to be solely responsible.

The considerations mentioned in the preceding paragraph are of overwhelming importance. In the following paragraphs attention is directed to a few points a study of which, experience shows, will often lead to material improvement in service.

Adequacy of staff and its correct distribution throughout the day and night is important. During the busy hour, when the 'bookings' are sufficient to load the circuits in accordance with the present standards (10 to 12 unit calls per circuit according to the length of the circuits involved), it is essential, under the trunk signalling system of working, for the circuits to be distributed as laid down by the regulations (2, 3 or 4 circuits to an inland position) and for each position to be staffed separately, if the operating procedure is to be correctly carried out, and satisfactory 'paid time' results obtained with the minimum of delay. Outside the busy hours the staffing of positions should be considered, half hour by half hour, care being taken that the load of two positions, when combined, falls below the normal load of a single position. (Co-ordination with the distant end is desirable when the coupling of positions is being arranged.)

A point that requires serious attention under the above-mentioned system of working is that when the number of bookings for a particular route falls below the carrying capacity of the route (this is the normal condition at night and often at other periods), *no delay* should occur on the setting up of calls, apart from the bare time taken to convey the tickets as quickly as possible from the record positions to the control positions. In setting up 'concentration' or partial 'concentration' conditions, the number of bookings plus the number of tickets carried over should be taken into account.

Duties should be arranged in order to deal efficiently with the fluctuations of traffic, and at the same time should provide reasonably good hours of attendance for the operating and supervising force. The number of staff changes at controlling positions should be as few as possible. When changes are necessary it can often be arranged for new positions to be taken up on return of operators from meal reliefs.

Excessive floor traffic in a switchroom is detrimental both to discipline and service. For these reasons, the efficient preparation of a duty chart for a large trunk exchange requires and deserves considerable attention. For each trunk signalling position, a chart indicating the hours the position is staffed and by whom, together with the method of working, is a desirable aid to the assistant supervisor in charge.

In the larger offices, in order to ensure that the most efficient staff is available for the more important duties, it is advisable to

specialise in groups of duties. The senior telephonists, who are frequently withdrawn from operating to act as supervisors, should normally be scheduled for duties of such a nature that they may be readily replaced by members of the relief force; this avoids the necessity of making a number of staff changes.

In arranging the layout of circuits on trunk signalling positions certain points can usefully be borne in mind. The allocation of the most important and busiest routes to the control positions nearest the record positions has in practice been found to reduce delay. The same point applies to the location of 'concentration' positions. The distribution of circuits over positions on a geographical basis has been found helpful in facilitating alternative routing.

A final word might be said on switchroom tidiness. The keeping of exchange records in a neat and orderly manner, the replacement of books of reference to their proper places immediately when finished with, the avoidance of littering of desks with tickets and memoranda, and general attention to quietness and cleanliness, all have their effect on the efficient running of the system.

CONCLUSION.

In conclusion, it may, perhaps, be said that few readers will be directly concerned with many of the multitude of items which go to make up the complete system of long distance telephony. On the other hand, many readers may be concerned with at least a few aspects of the system, and it is the belief of the writer that each officer associated with the trunk service, by tackling his or her problems with zeal and goodwill (without which no organisation can be conducted efficiently, however excellent the material equipment) is in a position to make a material contribution to the general improvement of the long distance system.

C.T.O. NOTES.

Promotions.—Messrs. C. B. Franklin, Asst. Supt. to Supt. (Lower Grade); F. G. King, Overseer to Assistant Superintendent; W. R. G. Bell, Overseer to Assistant Superintendent; H. Hibberd, Telegraphist to Overseer; A. A. Worrall, Telegraphist to Overseer; G. H. Parker, Telegraphist to Overseer.

Retirements.—Messrs. W. G. Godden, Superintendent (Lower Grade); E. Hopkins, Assistant Superintendent; L. M. Umpelby, Overseer; H. F. Aldous, Telegraphist; R. W. Dyer, Clerical Officer; Miss M. S. Tyler, Telegraphist.

C.T.O. Veterans.—Fifteen members enjoyed the outing to the Royal Park, at Greenwich. The tour of the gardens was very interesting.

"F" Division Ramblers.—Hertford was the county adopted for the venture in June, and 34 took the journey to Bayford. From thence fieldpaths took us through Birchgreen, Penshanger and across the Mimram, coming to rest and refreshment at Bramfield. A very happy time terminated at King's Cross about 10 p.m.

C.O.D.O.C.—"The Ghost Train," by Arnold Ridley, will be the Dramatic Section's first play for season 1931-2.

Sport.—Bowls.—The C.T.O. Club won their second league match against the C.S. Headquarters by 6 shots.

Presentation to Mr. T. G. Donno.—Mr. T. G. Donno, who has retired and therefore relinquished the Hon. Secretaryship of the C.T.O. Bowling Club, was presented by the members of the Club with an English hand-cut glass rose-bowl as a token of esteem and in recognition of the services he has rendered to the Club. Mr. Stuart Jones, M.B.E., made the presentation.

C.T.O. Benevolent Fund.—The 57th annual general meeting was held on June 12. The balance sheet for the year showed that £213 had been paid in grants to members and £225 15s. 0d. in grants to benevolent institutions. Receipts from subscriptions amounted to £489 9s. 0d. The total credit balance at the end of the year was £1,514 8s. 10½d. This fund does a great deal of good work in an unobtrusive manner, and the ladies and gentlemen who devote their time and energies to the cause are deserving of our best thanks.

REVIEW OF MANCHESTER AUTOMATIC SYSTEM

AFTER A YEAR'S WORKING, AND OPENING OF BLACKFRIARS AUTOMATIC EXCHANGE.

By J. M. CROMBIE, *Traffic Superintendent.*

It is a year this June since the automatic system was introduced at Manchester, when three exchanges, namely Ardwick, Collyhurst, and Moss Side were opened in June, 1930. Throughout the whole of the 12 months the system has been in operation no serious adverse comments have been received from any subscriber connected to these exchanges. On the other hand, there is ample evidence that the working of these exchanges is meeting with general satisfaction. The quality of the service may be judged from the percentage of "O" line, Inquiry and Complaints traffic which, after a few months, settled down to a figure of approximately 1.5%. This figure compares very favourably with London Exchanges, where the figure ranges

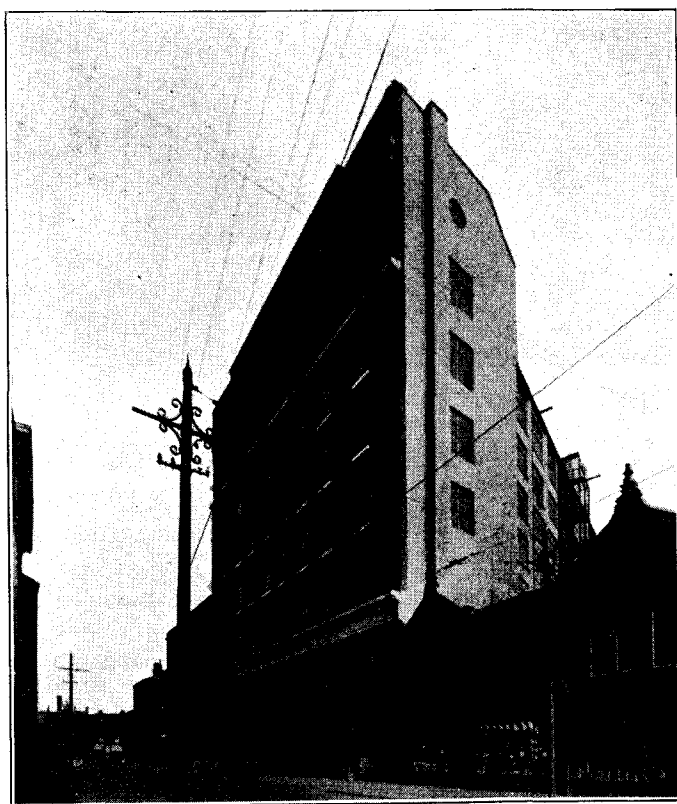


FIG. 1.—TELEPHONE HOUSE.

from 3.1 and over. To be fair to London, however, some of the higher figures refer, no doubt, to cases where exchanges have been opened quite recently, and where the conditions are not quite normal. It is encouraging to see that Manchester can produce a better figure than our recent rival Birmingham, but their splendid figure of 1.8% after such a short experience suggests that Manchester must look to its laurels if it is to maintain its top position for the country. Our low figure is likely to rise somewhat when the Call Offices are transferred from the City Exchanges to the Toll Board in September next, but no very large increase is anticipated.

The only disturbing feature of the present working of the Toll "A" Board is the difficulty in securing the standard 5 seconds speed of answer. So far, an average of 8 seconds is obtained. The question of call valuation is under review, and the matter of additional ancillary provision is also being considered with a view to obtaining the standard speed of answer.

The number of calls completed O.K. is approximately 80%. The 20% lost calls is accounted for as follows:—

	%
Number Engaged	11.0
No Reply (Ringing Tone O.K.) ...	4.0
N.U. Tone	1.5
Subscriber abandoned prematurely ...	1.5
Wrong Number, No Tone, &c. ...	2.0

As regards meter complaints, the incidence of these has been no greater than under manual conditions, and, only on two occasions so far, has it been necessary to place subscribers' circuits under register observation.

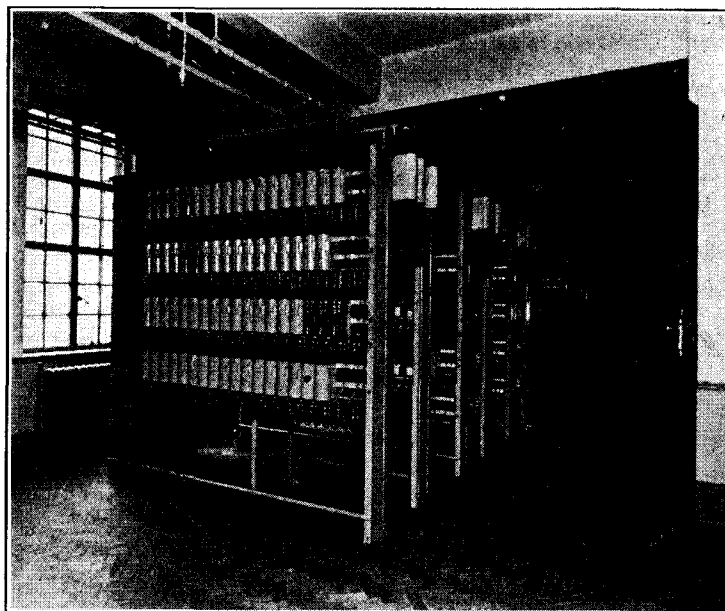


FIG. 2.—SELECTOR TRUNK BOARDS.

In the case of written complaints the latest figures give the following results:—

Service Complaints	%
Plant Complaints ... ..	.0008
	.0035
Total ... ..	.0043

Under manual conditions the figure is0035

The fact that the automatic exchange figures are slightly higher is due, no doubt, to the exchanges being in operation for so short a period.

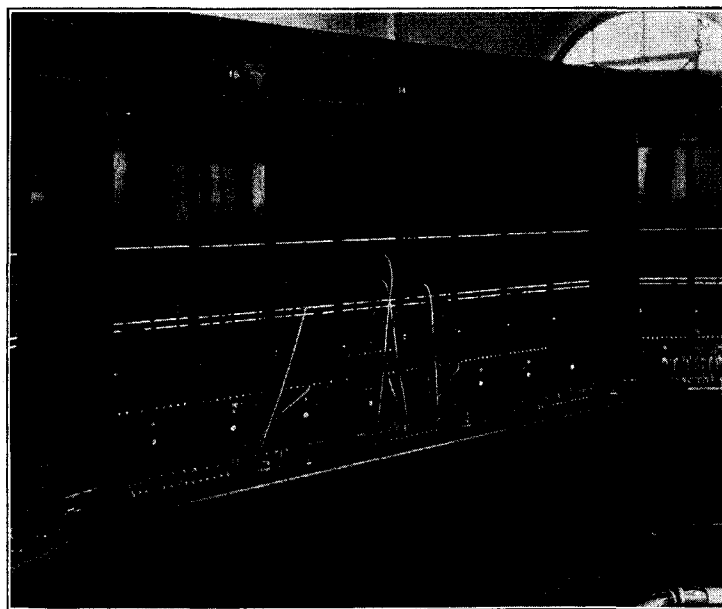


FIG. 3.—TOLL "A" POSITIONS.

Special mention should be made of the working of the 4-digit keysender suite with straightforward junction working, as this type of working in association with keysenders was quite novel at the time of its introduction. The system has worked exceedingly well throughout the whole period. It is anticipated that a load of about 600 calls per operator per hour will be possible when the additional Blackfriars traffic is handled at these positions.

At present, with a comparatively small team of 5 operators, an average of 500 calls per operator is obtained.

The call display installations at Central and City Exchanges which have been a very important feature of the Advance Automatic Scheme, have given satisfactory results.

OPENING OF BLACKFRIARS AUTOMATIC EXCHANGE.

A further stage of the Automatic System was reached on June 13, when the Blackfriars Automatic Exchange (10,000 unit) was opened by transferring to that exchange approximately 3,000 subscribers' lines from Blackfriars Hypothetical, Central, and City Exchanges. This is the first transfer to automatic working affecting the large business subscribers situated in the heart of the City, and considerable interest was taken by the subscribers in the change over.

The Blackfriars telephone exchange equipment consists of the following :—

Line Switches	9,640	
1st Code Selectors	1,114	
"A" Digit Switches	160	
Directors	164	
2nd Code Selectors	1,137	
1st Tandem Selectors	222	
1st Numerical Selectors	1,294	
2nd " " " " " " " " " "	1,296	
3rd " " " " " " " " " "	104	
Final Selectors :—		
Ordinary and Coin Boxes 480		1,784
P.B.X. (2-10 lines) Subs. 1,080		
" (11-20 ") " 129		
" (21-48 ") " 95		

The manual board equipment at the Toll Exchange consists of the following :—

Description.	Number Equipped.
"A" Positions	104
4 Digit Keysenders	22
Enquiry Positions	63
Service P.A.B.Ex. Positions	6
7 Digit Keysenders	18
Plug Ended "B" Positions	12
Desks :—	
Chief Supervisor	1
Divisional Supervisors	3

The area of the switch room is 2,300 square yards, and is claimed to be the largest telephone switch room in the world.

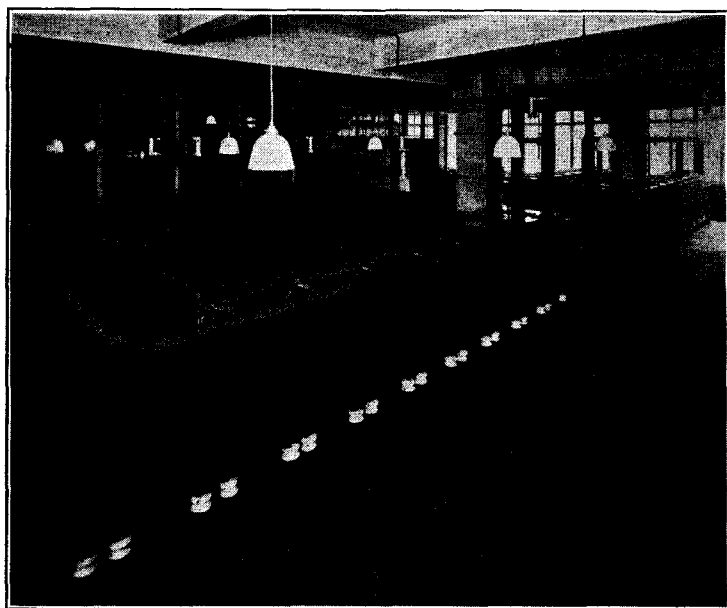


FIG. 4.—BATTERY NO. 6.

Power Equipment.

This consists of motor-generators, batteries and a controlling power switchboard.

The motor-generators are provided in duplicate, and each has an output of 3,200 amperes at 57 volts. They are arranged on concrete piers and are controlled by switchgear mounted near the motor. The motors are operated from the public supply mains at 400 volts, 3 phase, 50 cycles.

Batteries are also provided in duplicate and each consists of 25 cells, the capacity being 10,000 ampere hours at the 9-hour rate.

A power switchboard is provided for controlling the supply of current to the Telephone Exchange.

Two ringing machines are installed for supplying the required current for the ringing circuits. One of these machines is operated from the public supply current and the other from the exchange battery.

Dialling.

With the recent extension of call display working at a number of exchanges in the automatic area, automatic subscribers are now able to dial subscribers

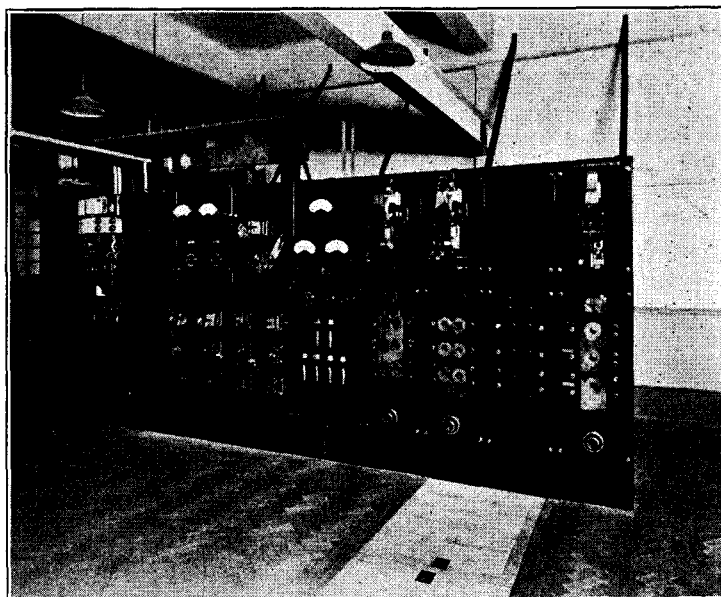


FIG. 5.—MAIN POWER BOARD.

connected to the following exchanges which cover a wide field in the Manchester automatic area :—

Ardwick.	Radeliffe.
Blackfriars.	Chorlton-cum-Hardy.
Central.	Rusholme.
City.	Swinton.
Collyhurst.	Trafford Park.
Didsbury.	East.
Droylsden.	Broughton.
Eccles.	Cheetham Hill.
Moss Side.	Prestwich.

Dialling Tones.

About the dialling tones the following lines were handed to me in the dark, last Sunday, by a man who got away before I recognised him. I read them over the same night to a judge of rhyme whom I know, and they drew from him some hot weekday sentiments about which the least said the better. However, the lines have a bearing on the various tones :—

When a low, purring sound you hear,
That means the way for dialling's clear;
A low "burr-burr," "burr-burr," "burr-burr,"
Strikes on the listening ear,
That means your correspondent's bell
Is ringing loud and clear;
A high-pitched, periodic buzz,
Is the automatic way
Of saying "Sorry, line engaged."
There's nothing more to say;
A high-pitched, loud, continuous buzz,
(The final tone for you to spot)
Means that, for some particular cause,
The number dialled can't be got.

A complete director demonstration set and call display position was fitted up at Manchester Head Post Office for three months, prior to the transfer, and demonstrations were given daily by an officer specially trained for the purpose. This arrangement proved of great interest to members of the public, approximately 1,500 of whom attended the demonstrations. Special demonstrations were arranged for batches of police officers who were sent for instruction by the Chief Constables of Manchester and Salford and the Superintendent of the Lancashire County Police.

The usual visiting of the subscribers by officers of the Post Office was carried out to explain in detail what was involved under automatic conditions.

On this occasion an officer from the Postmen's Office was attached to the visiting staff and was engaged in sorting the visiting cards into postmen's walk order, and associating the relative instruction cards except in the cases of P.B.X.'s which were dealt with specially. This arrangement proved very successful and effected a considerable economy in the distances travelled by the visiting officers.

Training of the Staff.

The training of staff has been carried out on a large scale, as many as three classes being held simultaneously. The teaching staff had a strenuous time, but they rose to the occasion and saw that every member was thoroughly trained in the new arrangements.

After transfer the testing of the subscribers' circuits was effected in record time, largely owing to the intelligent manner in which the subscribers co-operated with the testing staff. The number of faults of all kinds reported was only 27 and were cleared promptly.

Service Observations.

At the time of writing the exchange has only been in being for some 4 days, so that only a few observations have been possible. The particulars of these are as follows:—

	%.
Calls completed O.K.	80.0
Lost calls not due to plant or operating—	
N.E.	7.5
Sub dialled incorrectly	7.5
Sub. abandoned prematurely	2.5
N.U.	2.5

The follow up observations indicate that the percentage of O.K. calls and calls accounted for is approximately 97.

From these results it will be seen that the transfer was entirely satisfactory and effected without a single hitch. This was only made possible by the close co-operation between the Traffic and Engineering Branches, and to the excellence of the automatic plant. Much good work was also accomplished by the Manchester Automatic Committee, under the able Chairmanship of Mr. Crum, which reduced paper work to a minimum and enabled decisions to be given promptly, thus speeding up the work considerably.

The photographs of the plant with which this article is illustrated, and the description of the power equipment, were kindly supplied by the Chief Engineer of the Automatic Telephone Manufacturing Co., Ltd., Liverpool, who are the contractors for the work.

TELEGRAPHIC MEMORABILIA.

ONE cannot but be struck with the continued use by the public Press of telephoto pictures for the illustration, where such is possible, of outstanding features of important happenings at home and abroad.

The crisis in Germany naturally provided such opportunities. For example, certain street scenes following on the closing of the Darmstadter and National Bank in Berlin.

At the same time, it was particularly noticeable on this occasion how varied were the reproductions in their quality. No doubt, in the rush and whirl of producing a daily newspaper, it is not possible in all cases to give that care and refinement necessary for the reproduction of the perfectly printed picture, however sharp and distinct the actual received telephoto may reach the newspaper office. The unfortunate fact in the case of some of such press reproductions is, that many of the public are inclined to blame the telephoto system itself for any lack of clarity. Some of the most satisfactory daily press reproductions of late were certainly those which appeared in the *Daily Telegraph* of July 14, from telephotographs from Berlin.

Retirements.—The well-earned retirement of yet another engineer who, starting as a telegraphist, has reached all but the highest pinnacle of Post Office Engineering ambition, is surely that of Mr. E. H. Shaughnessy, who completed 44 years of service in the British Post Office and reached his 60th birthday on June 30. last. The very sincerest of congratulations of all in the telegraph service who knew not a little of Mr. Shaughnessy's ability, years and years ago, and those no less hearty of the host of co-temporaries of to-day will follow E. H. S. into whatever new activities may await him. One can hardly imagine the ex-Asst. Engineer-in-Chief saying "good-bye" to all his electrical interests, and he in such excellent fettle, too! It might be *au revoir*. Who knows?

From a somewhat smaller circle, but very closely associated with the Telegraphs, also entering the Post Office service as a telegraphist, and retiring therefrom only a few days subsequent to the ex-Asst. Engineer-in-Chief, there also passed out of the service another well-known figure in Mr. T. G. Donno, Principal Clerk in the C.T.O. Controller's Office. The departure of Mr. Donno from G.P.O. West upon reaching the age-limit—fit and well one is glad to be able to write—removes a worthy personality from those who were closely associated with him. One might not always agree with Mr. Donno's viewpoint, but certain it was that you could never mistake what and where that viewpoint stood. Emphatic at times, when emphasis might be mistaken for a certain sternness, but a keen sense of humour, wedded to a merry twinkle of the eye, which infrequently followed to soften the hastily interpreted inflexion. And now we may safely presume that our old friend and colleague will take to bowls in real earnest!

Promotion.—The fact that Mr. A. B. Hart has been promoted to the position of Asst. Engineer-in-Chief *vice* Mr. Shaughnessy, another telegraphist with the true technical turn of mind, who since 1928 has been in charge of the Lines Section of the Post Office Engineering Department, is accepted as yet another tribute to the potential engineering abilities of Government trained telegraphists. Let this not be taken as something in the nature of an apostolic succession! Nothing of the kind, for sixteen or more years Mr. Hart had rendered yeoman service in connexion with the development of the underground network. This, let it be remembered, during a period of unique advances in the technique of telegraph and telephone transmission. The noble army of telegraphists submit their sincerest wishes of goodwill to A. B. H., and heartiest congratulations.

A Unique Promotion for an ex-Telegraphist of the Cable Room, a well-known ex-Athlete of the C.T.O.—A very old friend and colleague of both the Inland and Foreign Telegraph Staffs of the C.T.O. is Mr. A. E. J. Harris, who has been promoted recently as "Marshal and Serjeant-at-Mace and also Chief Clerk in the Admiralty Registry." One never knows where the genuine telegraphist may turn up in the long run! Congratulations, my dear "Brass."

Personal.—Sir John Reith, Director-General of the B.B.C., received a medal from the Columbia Broadcasting System for "his distinguished contribution to radio art," in Chicago on June 9 last, the ceremony being broadcast throughout the United States.

Obituary.—Mr. Hugh C. Baker, organiser of the first Hamilton (Ontario) District Telegraph Co., in 1878, who subsequently became its President, died at his home in Hamilton on June 4 last, at the ripe old age of 85 years. He also organised the Bell Telephone Co. in Canada in 1880.

Companies.—Great Northern Telegraph Co. (of Denmark). Report for 1930 shows net receipts £403,379 against £441,483 in 1929. Total dividend and bonus, however, maintained at 20% for year. Siemens Bros. & Co. Ltd. 7½% ordinary dividend maintained £367,436 carried forward, against £338,511 brought in, and this, despite the fact that "shops devoted to manufacture of submarine telegraph cables were scantily occupied, and that the company's cable steamer, *Faraday*, had to be laid up for most of year. W. T. Henley's Telegraph Works Co., Ltd. Profit £349,089. as against £374,264 of corresponding previous year. After paying 4s. per share (less tax) 2s. cash bonus, £567,187 was carried forward. £50,000 also placed to reserve and £20,000 for obsolescence of certain machinery.

Countries.—ARGENTINA.—The wireless transmitting and receiving stations under construction in Rio de Janeiro by the Compañía Radio Internacional de Brazil are being prepared to work with those of the Compañía Internacional de Radio (Argentina) in Buenos Aires and the Compañía Internacional de Radio (España) in Madrid, as well as to provide direct service with the United States of America.

AUSTRALIA.—The Postmaster-General, in a notice to manufacturers, dealers, and listeners, accentuates the desirability of receivers being constructed to cover wavelengths between 200 and 545 metres. This is apparently due to the increase in the number of stations throughout the Commonwealth, which, we are given to understand, are mostly of the "B" class, and necessitate provision for the lower wavelength above mentioned. Some of the latest licence figures from Australia are of special interest. The tendency in Victoria has been downward of late, although the percentage of licences to population is higher than any other State in Australia, i.e., 7.76 as against 4.79 for New South Wales, 4.95 in S. Australia, 3.58 Tasmania, 2.57 Queensland, and 2.01 in Western Australia. It is worthy of note that the steady upward tendency "is to be found in the States with the smaller and more scattered populations." *Increased duties.*—Following an investigation into an application for an increase in the duties on dry batteries and dry cells, the Australian Tariff Board, says *The Electrical Review*, has recommended that no alteration be made in the 1921-8 tariff. Similarly, with regard to the duties on telephone and telegraph apparatus, the Board recommends that alterations be made in the rates now in force under the tariff decisions of June 19, 1930. The latest advice is that "a number of deferred duties which were to have been imposed by the Commonwealth Government on the 1st of last month, among which are valves for wireless telegraphy and telephony," have been postponed until January of next year. It is presumed that the recommendation of the Board has been accepted as regards all articles pertaining to telegraphy and telephony.

BELGIUM.—Schemes for relaying broadcasting programmes by private undertakings are now controlled by regulations drawn up by the Belgian Government. Written authority, securable only by persons of Belgian nationality, is to be the unfailing regulation for those desiring to exploit this method of re-distribution. The privilege only extends to the programmes broadcast from the stations of the Institut National Belge de Radio-Diffusion. "Relay distribution," says *The Electrical Review*, "must allow *simultaneously and constantly* a free choice to each subscriber of at least two French and Flemish programmes. In the area where German is spoken, each subscriber must have a choice of two programmes, one being that of the I.N.R. (see the *Institut* above), distributed in German." No apparatus capable of transmitting signals or messages is permitted. Subscribers are to be free to use a loud-speaker of their own selection. Hotels and boarding-houses, &c., are apparently to pay the usual tax for each apartment connected. Hospitals, sanatoria, and similar places of public service need only pay a single tax for the entire establishment.

BRAZIL.—According to the *Board of Trade Journal*, two decrees (Nos. 19,881 and 19,883) of April 17, 1931, established conditions governing the operation of internal and international telegraphy and telephony. It is possibly news to quite a number of *T. and T. J.* readers, that hitherto there has been no national law regarding "the operation of internal and international telegraphy and telephony." The decrees mentioned call attention to this fact, and now restrict the internal telegraph service to the Federal Telegraph Department and to the National Railways, except in so far as the cable companies may have existing rights by concessions. These, however, are not to be renewed. The Federal Government may, however, grant permission "without privilege or monopoly," to national or foreign companies for national services.

CANADA.—According to the *London Times*, on June 30 last, the Supreme Court at Ottawa delivered judgment on the respective rights of the Dominion and the provinces to control broadcasting, an issue raised by the Provincial Government of Quebec. (See *T. and T. J.*, April.) The Court held, by a majority of three to two, that control was vested in the Dominion Parliament, and not to the Provincial Legislatures, on the ground of "convenience amounting to necessity." It seems more than probable at the time of going to press that the Quebec Government will appeal to the Privy Council. Should this latter reference to the Home Government be made, the alleged unsatisfactory situation of

broadcasting, as between Canada and the U.S.A., is still unlikely to be changed for some time to come.

FRANCE.—*The Electrical Review* states that it is expected that by the end of the present year there will be two transmitting sets established between Paris and Algiers "capable of allowing four telephone conversations and two telegraph messages to be transmitted simultaneously during sixteen hours of the day. During seven hours the line will be available for two telephone conversations and one telegraph message, the remaining hour of the twenty-four being devoted to testing and the adjustment of the apparatus."

GERMANY.—The possibilities of wireless are undoubtedly far from being fully explored, but an incident in connexion with a West Germany broadcasting station, which occurred one evening last month, is certainly not recorded here as an example to be followed, but as a contingency against which due provision should be made. One of the German opposition parties managed to cut the land wires of the station in question and, connecting up their own apparatus, delivered a somewhat violent address in favour of their own particular political creed! This provides yet another argument for underground as against overhead lines. The number of wireless licences issued in Germany up to March last was 3,731,681, an increase of 6.3% as against an increase of over 15% as at the end of December.

HOLLAND.—The new Atlanta Hotel at Rotterdam has been wired and equipped to provide a complete radio and musical service. A central control room serves the various restaurants and dance floors, while each guest-room has a loudspeaker and switch for choice of alternative programmes, gramophone music, or the hotel's own orchestras. It is said that a similar, if somewhat smaller type of the same system, has been installed in Bayswater, London. One is permitted to wonder how far such a system is removed from a Relay Exchange? *The Dutch Telegraph Service.*—From the British Commercial Secretary's Annual Report on economic conditions in the Netherlands, it is informative to make the following extracts:—It is interesting to note that, "the fall in the revenue from the ordinary Telegraph Service was actually compensated for by the increased income from radio-telegraphy," and this despite the continued expansion of telephone business. It should, of course, be remembered that Holland, like Belgium, has been one of the last to feel the pressure of world economic conditions.

KENYA.—The direct wireless telegraph service between England and Kenya Colony was taken over from the British Post Office on the 1st of last month by Imperial and International Communications. The receiving station in Kenya is at Nairobi, and is operated by the British East Africa Broadcasting Co.

NORTH AFRICA.—The power of Radio-Morocco is to be increased from 1.2 kw. to 8 kw., and the height of the aerial towers to about 150 feet. A modern transmitter is to be erected at Meknes, between Rabat and Casablanca, the power of which is likely to be between 15 and 20 kw. A new station will probably be installed at Nabeul, about 30 miles from Tunis, where the studio is to be placed and connected by a special telephone line. **RUSSIA.**—The Soviet Government has increased telegraph rates from seven kopeks (14 cents American) to ten kopeks for 25 words.

SPAIN.—The new Government of Spain has specialised the public services of Post, Telegraph and Telephones to the extent of incorporating them under a new Ministry, that of "Communications." These important services were formerly under the care of the Department of the Interior, where, apparently, their importance was insufficiently realised.

SWITZERLAND.—The International Broadcasting Conference, which met at Lausanne on June 25, continued until the end of the month. Reuter's agency reports that important questions concerning the distribution of wavelengths, frequencies, and the power of broadcasting stations were discussed. The exchange of broadcasting programmes and the difficulties arising from "atmospherics" were also included in the agenda.

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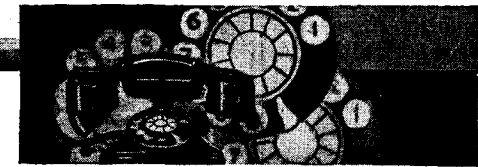
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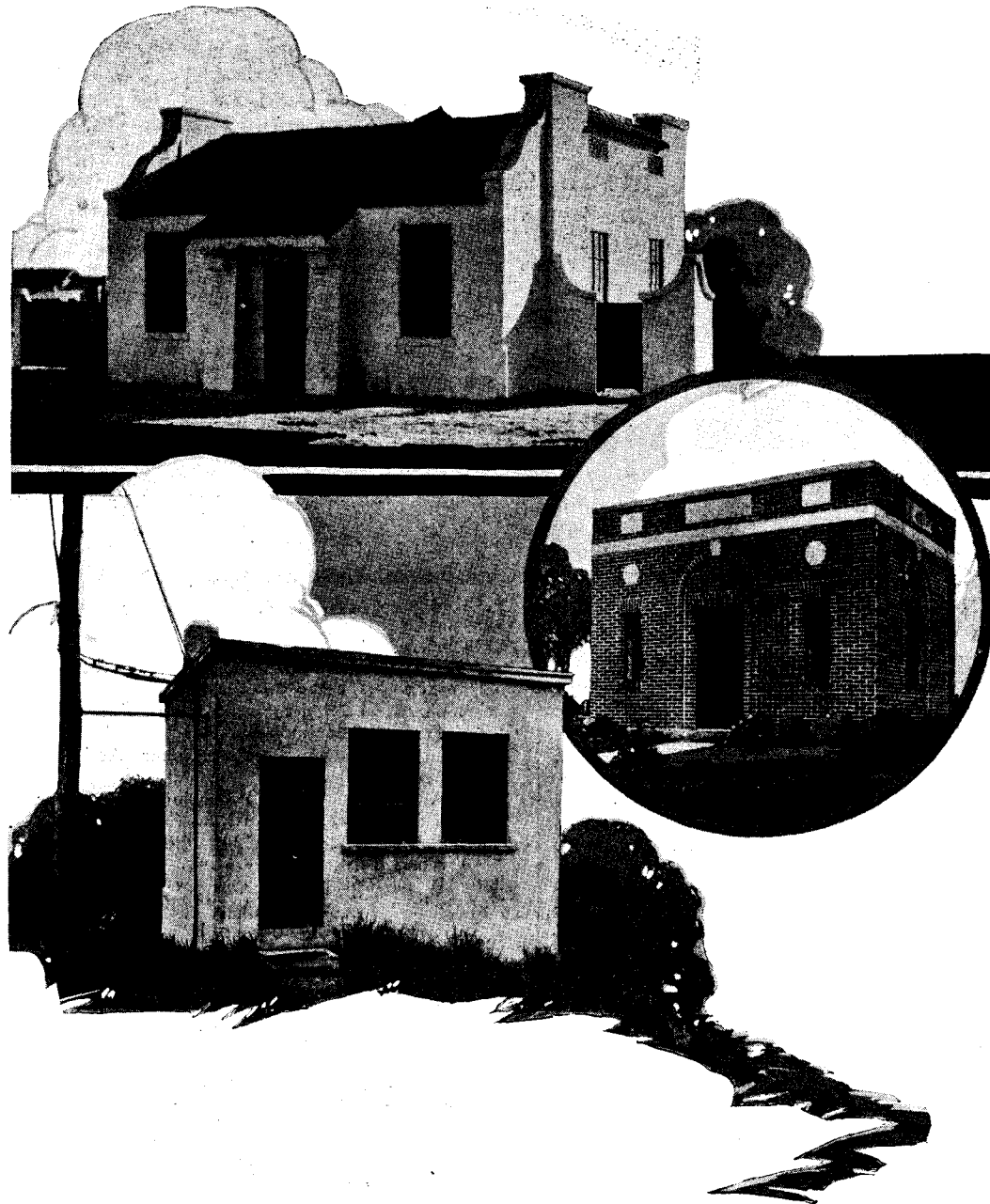
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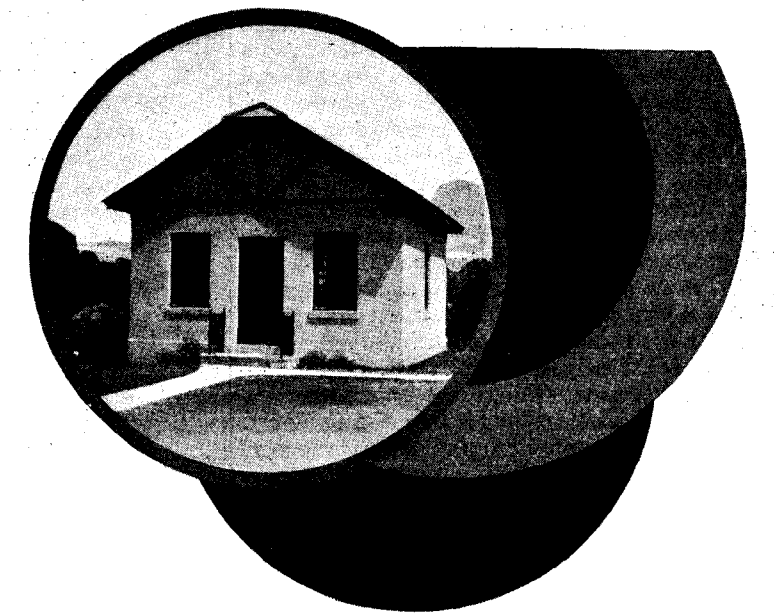
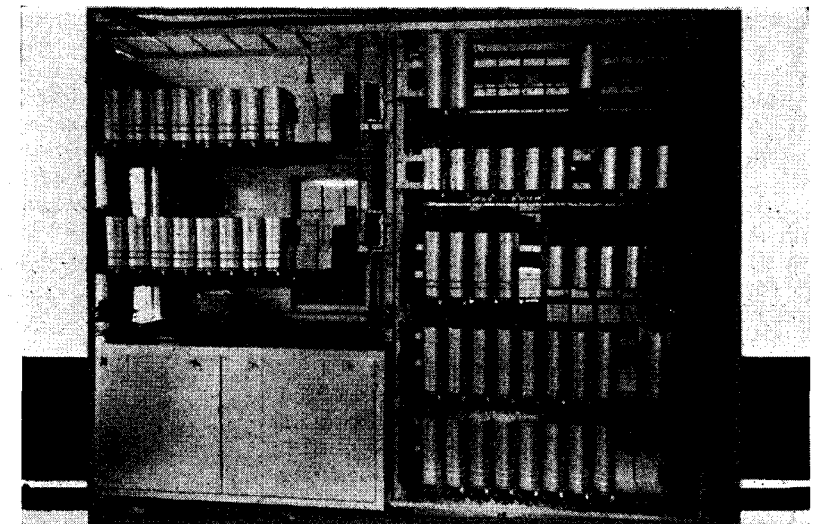
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U.S.A.—Reuter's Trade Service (New York section) gives some interesting information regarding wireless reception apparatus on the other side of the Atlantic. "American receiving sets, although destined in most cases to a cramped existence in a three-room apartment," says this Reuterian communication, "have hitherto been somewhat large." It appears that the *average* number of valves used in the States is seven against only three in Great Britain. Reasonably enough, the cabinets are correspondingly larger, and one may venture to presume that it is because there is no immediate chance of an increase in the size of the three-room apartment that the radio trade of Chicago has concentrated upon a reduction in size, though the *console* cabinet has by no means lost favour. "Loudspeakers have been made to fit midget cabinets, and it is estimated that over half the total sales for the present year will be of midget sets." The added information given is that "the general employment of two 'new types' of valve has made it possible for manufacturers to make smaller sets, the *pentode* eliminating two or three valves, and the *variablemu* minimising distortion sufficiently to eliminate, to some extent, complicated volume control. The sales of wireless sets of all types of receivers for 1930 amounted to 3,800,000. It is anticipated that the figures for 1931 will reach the four millions. It is hoped that these figures have been fully verified, for it is stated by *World Radio* that information released by the Census Bureau from 25 of the 48 American States, with special reference to the census returns of wireless receiver ownership, "*proves* that there are not nearly as many sets in the country as had been imagined." *Wireless transmitters*.—The Radio Division of the American Department of Commerce announces that 80% of the total number of licensed *transmitting* stations in that country are run by amateurs. Of the total number of 22,972 licensed for this purpose, no less than 18,994 licences are made out to amateurs, the remainder being divided as follows:—Ship stations, 2,173; broadcasting, 612; commercial land, 468; experimental and visual broadcasting, 391; commercial aircraft, 215; geo-physical stations, 119.

A New Antenna System.—The *T. and T. Age* gives the following outline description of a new system for radio reception which has been developed by the R. C. A. Victor Company engineers in Camden, N.J. It consists of a single antenna which intercepts the broadcast signals, amplifies them, and distributes the radio frequency energy to wall plate outlets by means of a single metal sheathed cable concealed in the walls like an electric wiring system. Besides doing away with the usual disfiguring maze of antennae and leading-in wires, the use of these wall outlets is like adding another tube to the receiving set to which it is connected, so the engineers contend. An important feature of this new radio system, it is maintained, is that every set owner in the building gets exactly the same high grade of radio reception, whether all the receivers are tuned to the same station or each to a different one. It is also affirmed that the system automatically cuts out local electrical interference that mars radio reception in buildings where main electrical appliances are constantly in use. *He was not Elected!*—A Mr. Robert G. Duncan, of Portland, Ohio, reports the *American papers*, was broadcasting during his campaign for a seat in Congress. He grew warm, and yet warmer in his appeal, and so did his language, which, when repeated before a judge, entitled him to six months imprisonment and a fine of \$500. The judge confirmed the title. *American Aeronautics and Telegraphy*.—The U.S. Department of Commerce is working on the development of a radio supplement to the automatic telegraph-typewriter system used on airways for transmitting weather information to the various stations along a line of flight. "The application of wireless to the automatic telegraph-typewriter," says Reuter's Trade Service, "will have a number of obvious advantages, making it possible to extend service to outlying stations without establishing additional circuits."

The Invention of Writing.—It is the greatest invention Man has ever made, this of marking-down the unseen thought that is in him by written characters. It is a kind of second speech almost as miraculous as the first.—*Heroes and Hero Worship*.—T. Carlyle.

J. J. T.

LETTERS FROM A RETIRED CONTRACT MAN TO HIS SON.

(II.)

My dear Tom,—We were pleased to get your letter. You seem to be having a strenuous time learning your job. Mother hopes you are not working too hard, but probably all you are likely to suffer from is an attack of mental indigestion. Get some outdoor exercise when you are free, and this will help to clear your brain and enable you to assimilate the rather heavy fare that is being placed before you in pretty hefty doses.

You are lucky, however, in that you are getting the combined experiences of a generation of contract men, which took them years to compile, condensed into a few weeks' study. I wish I had had your chances when I started my career in the Contract Branch. In those early days of the telephone business we contract men had, as often as not, to blaze our own trail. The written instructions, as you know them, were practically non-existent, and our training was meagre in the extreme, and we had to move with caution until we found out for ourselves the why and wherefore of things telephonic. I don't think people were so critical in those days, anyway.

The schedule of training, a copy of which you sent me and which has been set up since my day, seems very comprehensive and positively makes me quite envious. What a lot of worry and trouble I might have been saved, and how much better I might have served the Department and myself, if only I had had the training indicated. Ah, well, perhaps after all my self-education may not have been a bad thing, for if the training was slow it was certainly sure and not easily forgotten, and the pleasure which was extracted from finding a new argument or some fresh technical knowledge is something to remember. Now it is all set out for you and should make you efficient in much less time than was possible in my early days. We made lots of mistakes and learned the right trail by bitter experience, but if we made mistakes—and it has been truly enough said that a man who never makes a mistake never makes anything—we had the wisdom to profit by them and never made the same mistake twice.

By the by, talking of mistakes, you will make some, no doubt, and when you do, own up at once and never fall into the same error twice. Chiefs hate to have to go on correcting members of their staff on the same point over and over again, and sooner or later get peeved and things become strained, which is bad from every point of view.

I am glad you think that the various pointers I gave you in my last letter will help you in your work, and while I know that many of them are in your official hand-book, which our local Contract Officer showed me the other day, they bear repetition and emphasis, and, probably, coming from your old Dad, will be considered more worthy of following than if you only got them from an official source.

When you get on your ground you will meet many new experiences which you will have to cope with, and this is where your intensive training will stand you in good stead. Some of the points raised by members of the public may be new to you, however, and for the sake of others you should bring the case to the notice of your Chief so that he, may, an' he thinks fit, tell the other Contract Officers and thus enlarge the common knowledge.

Talking of knowledge, it has been said that "knowledge is power." Knowledge of your particular job, knowledge of people and things gives you a pull over those who take no trouble to make themselves efficient but are content just to know enough to enable them to scrape through without getting into trouble. Of course, the knowledge you acquire must be properly used. It must be tucked away in your brain, to be produced in the most suitable form at the proper time.

You ask me to tell you the best way to approach your prospective subscriber. Well, now, that is a bit of a poser. However, I'll do my best but I must confess that that never bothered me.

You must weigh up your man or woman properly as a beginning, and the state of an office or even the state of the front garden or the general appearance of a house if properly studied will give you a lead as to the possible state of mind of the people who work or live in it.

Learn the name of the person to be interviewed. There are many ways of doing this; for instance, if you are to see the manager of a firm ask the officer boy or clerk who is leading you to him what his name is, and you can greet him as Mr. Smith or Mr. Brown or whatever his name may be. The name of a householder can be got from the directory or a house-agent (whom you should cultivate) or from a neighbour or the postman. By every means in your power, then, get the name; it makes things ever so much easier for you. People like to think that you are taking a personal interest in them.

Having obtained an interview, introduce yourself by stating that you are a representative of the Post Office Telephone Department. People like to know to whom they are talking. Follow this up by a statement that you think you have something to say which will be of interest to him and that you would like to have a few minutes of his time to explain the matter. Carry on with a few general arguments as to the advantages of telephone service or an extension or private branch exchange or whatever type of service you wish to sell.

Your arguments must be sound and concise; not a learned-by-heart story which a sudden question will put out of gear, but a properly constructed edifice with good foundations and a sound upper structure which will not be blown over by the first gust of adverse criticism but will stand any strain that may be put upon it.

Concentrate on the case in hand. A Contract Officer whose conscience or stomach is troubling him through some indiscretion cannot give that close attention to his work which it requires, and he is slipshod and careless and lets obvious opportunities knock at his door without eliciting any response till they turn away in disgust and leave him for good, and he curses his bad luck without having the sense to see that he has only himself to blame.

Remember always that you are a salesman, not a gramophone record repeating on every occasion a set piece. A record you can buy for a couple of shillings but a good salesman is beyond price.

Use your brains, for a success or a reverse depends in many instances on a battle of wits. Look upon every case as a game or a fight in which you would hate to be beaten, and keep the Boy Scouts' motto "Be Prepared" always before you.

Use all the tact and persuasiveness you possess in every case, no matter how small the order is likely to be.

As I have told you before, a pleasant manner and a smile—not a fixed, fatuous grin—and good temper always, will see you through many a hard tussle.

Make judicious use of the advertising matter supplied to you and, so far as possible, always leave a suitable advertisement behind you.

Look your prospect in the face. You have nothing to be ashamed of. You are not selling a catch-penny device but an article of proved merit which thousands of other people in the same position as your prospect are using every minute of the day and finding it pays to do so either by time and trouble saved or by orders obtained through its help.

The value of telephone service in the home in cases of emergency should be enlarged upon; in cases of illness or fire or burglary its merits have been proved on countless occasions. As a social asset it is second to none. The advantages to a business man of an

entry in the telephone directory can be touched upon and so on. When you see that your prospect shows a spark of interest in any particular point you make, get the bellows going and blow like blazes and be prepared to enlarge upon that particular aspect and press your case hard but not hard enough to antagonise your listener. Watch your man and shift your ground immediately you see that your argument palls.

Much depends on your first interview. You may make or mar your case by faulty tactics at your first call and never get a second chance to make good your mistakes. Keep your eyes and ears wide open, ready always to take advantage of a suitable opening.

You must appreciate that no two possible subscribers are alike and each has to be treated differently. One will appreciate cold facts, the other is open to arguments of a different type, therefore, decide as promptly as possible the type you are interviewing and vary your arguments accordingly. A dud salesman never sees the difference and wonders why he fails to get orders.

Be persistent in following up cases where you think the prospect ought to have telephone service. He may not know it, but sooner or later he must have the service and it is your job to make it sooner rather than later, and your value as a salesman depends on how soon you can make him sign the contract.

Some of your orders come to you as a result of applications. Anyone could get those. They can be got by sending an agreement from the office, but a real live Contract Officer will not be satisfied if he sends in to the office just what the would-be subscriber asks for. He will go all out to get additional business. He will weigh up the office or house and press for a private branch exchange or a simple extension. He will get names of people the subscriber—for he will now be a subscriber—would like to get into telephonic touch with, and find out if he has a connexion at his home, and explore all possible avenues which might lead to more business.

Impress upon the person you are interviewing the fact that you are anxious to help him in every way. Suggest that he would be interested to see an exchange and give him a card of invitation; do this even if he has signed a contract, he will then appreciate what is happening at the other end of his line.

He may raise the question of the cost of telephone service and say that it is dearer than in America or Sweden or Timbuctoo, and may wish to know when the rates will be reduced in view of the drop in commodity prices, and so on. To take the last point first: telephone rates have been reduced on several occasions since the new rates were introduced in 1921—these reductions have been made in advance of the general fall in prices. How many traders could say the same? It was distinctly stated when the system was taken over by the State that the Post Office was not out to make a big profit but practically to sell service at cost price. Hence the reductions referred to. Others will follow, no doubt, and recent cases, I see from the newspapers, are the reduction by 50% in the rent for hand microphones and the concession with regard to long cords. Small matters, yes, but proof that the Department is not a grasping octopus but does study the possibilities of reducing charges. You should point out, too, that the telephone system, unlike other businesses, is in an unusual position, in that the more telephones there are the more costly per telephone it is to provide the service. Exchanges have to be multiplied—a costly business—and the more exchanges the more junctions and what not are required, but here is a good point; the more subscribers we place at the disposal of a subscriber the more valuable is the service to him and "every day in every way" he is getting more value for his money. Enough, perhaps, to justify an increase in rental, and it is only strict attention to economy and the adoption of new ideas which enables the Department to maintain rentals at present levels and even to reduce them. With regard to the first point, the rates abroad are so various that I won't trouble you with them, your chief will tell you all about them if you ask him, if he has not already done so. The whole matter, however, can be summed up in the remark that you must compare like

with like. Economic conditions vary throughout the world. Labour and materials are cheaper in some places than in others, which obviously affect the economic position. Some administrations make an installation charge. Some charge a rental for switchboards. Some give a restricted service. Some work in a circumscribed area which is obviously cheaper to work than a territory like Great Britain which includes many rural areas which must be served, but which cannot be supplied with service so cheaply as urban areas; indeed, if the rentals charged are to be acceptable to the people in these areas, they may be run at a loss as is exactly what happens in this country.

Mother says I had better leave something to say next time, and I guess she is about right as usual. I had intended to tell you how the garden is progressing and about the pergola I am planning, but that will have to wait. Anyhow, I hope these rather random remarks may help you and anything you are not clear about we will talk over when you come down to see us, which is not far off now. Mother says that I am to tell you that she will write you a proper letter, not a lecture, in a day or two. Love from us both. Telly and Fony would like to be remembered to you, at least they would say so if they could, poor dears. Cheerio.

Your affectionate Father,

THOS. E. L. SERVICE.

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

VIII.

DESCRIBE the construction and action of a magneto bell.

A prize of a book will be awarded for the best answer, which should reach the Editor by Aug. 31. The correct solution will appear in the October issue.

There was a severe fall in the number of entries for the June competition. Perhaps readers fight shy of the subject of automatic telephony, or is it that the long light evenings of June possess so many other attractions? It is hoped that the question set for this month will encounter a better reception.

Of the two answers submitted, that by Mr. G. S. Edwards was very good, but it is too long to reproduce here. Mr. Edwards gave a detailed description of the operation of the unselector, group and final selectors, and supported it by four diagrams of connexions. The answer submitted by Mr. R. N. Renton, to whom the prize is awarded, is reproduced below:—

SOLUTION OF QUESTION VI.

The process of connecting together two subscribers on a Strowger 4-digit automatic exchange is essentially similar in principle to that obtaining in a manual exchange, the duties of the operator being performed by a series of selecting switches.

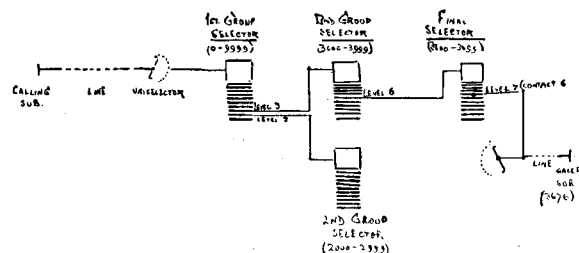
Individual "answering" equipment, the "unselector," or line-switch, is provided for each subscriber's line, and a series of two group selectors and one final selector, provided on a common basis, simulates the cord circuit in giving access to the subscribers' multiple. Three conductors, corresponding to tip, ring, and sleeve, of the manual system, are employed throughout.

The required number is reached by a system of decimal selection. The first group selector responds to the "thousands" digit from the subscriber's dial, and connects to a second group selector dealing with the particular group of a thousand lines: this second selector is controlled by the "hundreds" digit and locates a final selector having access to a hundred subscribers, from which the required line is chosen by the "tens" and "units" digits.

Each selector has one hundred sets of triple contacts, arranged in ten levels, to which connexion is made by metal brushes or "wipers." The wipers are stepped, firstly, in a vertical direction

and then in a rotary direction by electro-magnets, these being controlled, via relays, from the dial.

When a subscriber lifts his receiver, his unselector commences to rotate over 24 sets of contacts to find a disengaged first selector. From this selector dialling tone is transmitted, and the wipers step vertically when the first digit is dialled. While the subscriber prepares the next digit, the wipers automatically rotate in search of an outlet to a free second selector, which subsequently steps and rotates similarly to find a free final selector. At this stage



the wipers rise with the tens digit, and step in a rotary direction with the units digit, having now located the line of the required subscriber (Fig. 1). By the operation of relays, ringing current is now applied to the called subscriber's bell and ringing tone passed back to the caller. When the called party answers, the ringing is tripped and a battery pulse, applied to the third conductor, operates the meter of the calling party. Conversation can now proceed over the other pair of conductors.

Had the required party been engaged, an "engaged" tone would have replaced the ringing tone, and the called line remained uninterrupted. On cessation of conversation, the replacement of the caller's receiver restores all selectors to normal.

[If Mr. Renton will give us his address we shall be pleased to forward him his prize.]

LIVERPOOL NOTES.

THE following extract from a letter received from a subscriber shows that in spite of those who see no good thing in the Telephone Service, our efforts do not always go unrecognised.

"It is to me important that you thank your staff at ——— Exchange for the courtesy and prompt attention to us at all times. The ladies and your night gentlemen deserve our best thanks, for it was they who made the telephone a delight in our household."

The Post Office Golf Society is still going strong. In an enjoyable match with the Dudley Golf Club, consisting of ladies' singles and mixed foursomes, the Post Office managed to record another victory by 13½ to 6½ matches.

A still further extension of the overseas communication was tested, when a test call was made by the British Vice-Consul at Cagliari, Sardinia, to Liverpool.

We are pleased to record the promotion of Miss D. Taylor of Birkenhead, to the chargseship of the Ellesmere Port Exchange. Miss Taylor is a well-known and popular member of the staff on the Birkenhead side of the river, and will carry with her the best wishes of her colleagues on her promotion.

We hear with deep regret of the sudden death of our late Chief Superintendent of Telephones, Mr. William Lee, who retired some two years ago. Mr. Lee was a man of scholastic attainments in Philosophy and Arts. It was hoped that in his retirement, which was earlier than at the allotted age of 60 years, he would have enjoyed many more years of life. By his brother's early (comparative) death after retirement, which will be remembered by all telegraph and telephone men and women, and more recently his sister's, also shortly after superannuation from the teaching profession, Mr. Lee had lost his only remaining close relatives.

Mr. G. Green, of the Liverpool Traffic Department, has attained the distinction of a 1st class pass in the City and Guilds Final Telephone Transmission.

CORRESPONDENCE.

TELEPHONE CHARGES.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—I shall be greatly obliged if you can find space for a reply to your criticism of my suggested scheme of uniform charges for all telephone calls *irrespective of distance*.

As long ago as 1913 in a little book called "Royal Railways" (by analogy to "Royal Mail") I suggested the adoption for railways and telephones of the principle of "Penny Postage" founded by Sir Rowland Hill in 1840.

That principle is that postal services being national, should be available on equal terms for every individual in the United Kingdom and that therefore the nominal rate of one penny (the minimum rate then in force) was fixed as the rate for one letter of one ounce weight for all distances, even though the receipts should not be sufficient to cover expenses. The actual result was that although in the first year after penny postage was adopted there was a deficiency of £2,000,000, the subsequent increase of letters was so progressively great that the deficiency was soon turned into a surplus.

In 1838 postal rates varied from one penny locally to several shillings for long distances (as telephone calls do now), and the average rate for all letters was about 7½d. The number of letters carried was doubled in the first year after the adoption of penny postage, was increased eight times by 1863, and doubled about every 20 years afterwards.

The same principle was applied to telegrams in 1870.

But your critic contends that the telephone service is on an entirely different footing to either the postal or telegraphic service and that therefore the analogy, though "superficially appropriate" is fallacious, and that "the inherent unsoundness of such analogies is obvious to those who have given any thought to the subject."

This conclusion is based on the contention that in the telephone service there is no "bulk service," which the user can tap, as in the case of letters and telegrams, and that every subscriber needs an individual plant on his premises, a pair of wires to his local exchange with several terminals there, and the exclusive use of the circuits during a telephone call.

The first argument appears to ignore the fact that the whole of the telephone system between the terminals at each one of the two local exchanges of the two "individual plants" is the "bulk supply" which the user taps.

Secondly the cost and maintenance of the "individual plants" is or should be covered by the rental charged to each subscriber. This leaves the question of the amount to be charged for calls to be treated exactly by analogy to the postal and telegraphic services with the additional advantage in favour of telephones that no individual service by postman or messenger is required at the end of the journey as with letters and telegrams.

If this be so, I submit that once the "bulk supply" is provided, the cost of a telephone call between any two exchanges in the United Kingdom should be a uniform rate, as the fixed charges and operating charges will remain constant.

Now let us see how this principle is likely to work in practice.

The statistics supplied by Sir Henry Bunbury, K.C.B., as reported in your journal for April last, show that there were 1,325,000,000 local calls and only 120,000,000 trunk calls. These produced, together with rentals of nearly 2,000,000 stations, a total sum of £21,892,000—the total expenses being £21,379,000, leaving only the small surplus of £513,000. The average receipt for every call, including rentals, is only 3½d.

The fixed plant charges amounted to 48% and the administration and operating charges to 28% of the revenue.

The respective amounts of receipts for rentals and calls are not stated. For a rough estimate I will assume that rentals may average £4 per annum.

Now what should be the rate for calls on the principle of "penny postage?" The main difference between the telephone service and postal and telegraphic services is that two persons only can use the telephone at the same time to the exclusion of others who require the use of one or both of the lines then in use. The rates should therefore be calculated strictly on a time basis, irrespective of distance. For instance, one penny should be the standard rate for three minutes. Any period over three or possibly six minutes might be charged at double the rate, with concessions of longer time out of business hours. For business firms the reduced charges for calls would induce the installation of more lines to secure uninterrupted conversations.

There might also be provision for a special rate of, say, 1s. for an urgent call to take precedence over ordinary calls.

The adoption of "Penny telephones" would certainly result in a great increase of subscribers and calls.

Let us assume, however, that this would result in an increase of only 12½% in rentals, and of 25% in calls and that the average rate of calls on the time basis should be 1½d. The total revenue would then be:—

2,250,000 rentals at £4 each	...	...	£9,000,000
2,250,000,000 calls at 1½d.	...	...	14,000,000
			<u>£23,000,000</u>

I suggest that with this increase in stations and calls the increase of fixed plant charges and operating costs would be more than covered by the additional revenue of £1,000,000.

I shall appreciate further criticism (even though it may be adverse) and also any further suggestions, my desire being to make known ideas which have occurred to me in the study of economic problems of transport, in the belief that the nation as a whole and ultimately the whole civilised world will benefit by the fullest possible extension of the principles founded by Sir Rowland Hill.

WHATELY C. ARNOLD.

London, S.W.2, July, 1931.

[The above letter is referred to in the editorial column.]

FOLKESTONE AUTOMATIC EXCHANGE.

THE conversion of the Folkestone area telephone system to automatic working, at 2.0 p.m. on June 13 last, marked further progress in the provision of up-to-date telephone equipment in this country and the completion of an engineering work of some magnitude. Special buildings to house the equipment were erected at Folkestone, Hythe, Cheriton and Lyminge. At Sandgate an existing building was acquired and adapted. The exchange equipment was installed by Messrs. Ericsson, Ltd., particulars of which are as follow:—

Exchange.	Line Switches.	Final Selectors.	Ultimate Capacity of Selector Multiple.
Folkestone ...	2,200	2,600	7,000
Hythe ...	800	1,000	3,000
Sandgate ...	400	500	1,100
Cheriton ...	320	400	1,200
Lyminge ...	160	200	700

The number of working lines and types of switchboards existing up to the time of transfer were: Folkestone (magneto) 1,543, Hythe (C.B.) 549, Sandgate (magneto) 223, Cheriton (magneto) 170 and Lyminge (C.B.S.) 80, making a total of 2,565 subscribers' circuits. The actual transfer of all the exchanges was accomplished in ten minutes.

The conversion of telephone areas to automatic working is now more or less a common occurrence, but the following are a few items, which may be of interest to readers.

The auto manual board for the area is situated at Folkestone and, with the power plant and switching apparatus, occupies three floors of the new building. The manual exchange equipment consists of:—

1 Supervisor's desk, 4-position monitorial desk, 4 special control trunk positions, 1 jack-ended incoming position, 1 jack-ended "B" position and 7 "A" positions.

The trunk offering circuits for the satellite exchanges have a 4-digit system of dialling instead of the hitherto standard system of full digit dialling.

The satellite "O" level groups are common to subscribers and coin box lines, calls from the latter being distinguished by a flashing signal of 0.2 seconds on and 0.2 seconds off. Red reminder rings are placed by the operators over the rear speaking keys when dealing with calls on which the flashing signal is received.

Provision had to be made for non-dialling calling facilities in two cases owing to the subscribers, through infirmity, being unable to manipulate a dial. In one case (Folkestone) the subscriber calls direct on central battery calling equipment; in the other (Hythe) the removal of the subscriber's receiver from the rest operates a line switch which finds an "O" level outlet to the auto-manual board at Folkestone.

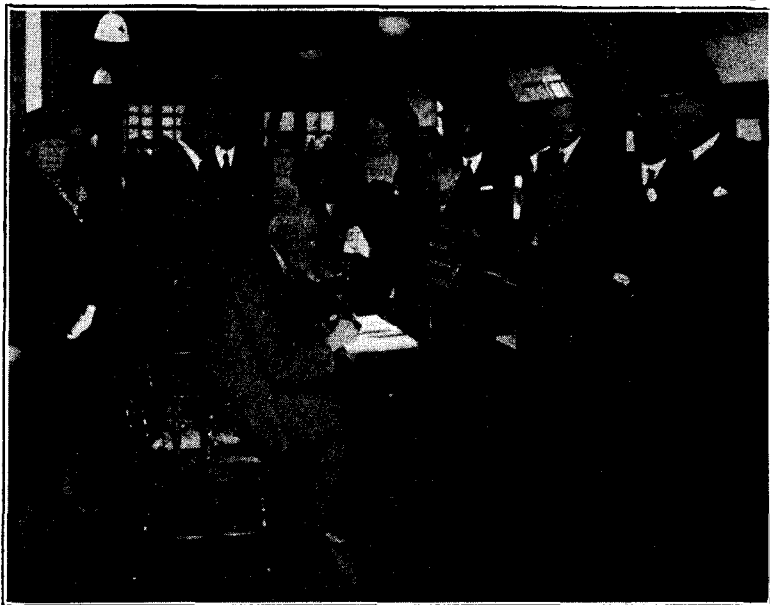
Details of Folkestone's early telephone history are meagre, but from one of the original operators, who still resides in Folkestone, some information has been obtained. So far as can be traced the first telephone service was inaugurated in Folkestone in 1886. The switchboard was primitive in design and circuits were worked on the single wire, earth return system. Each subscriber had his own numbered plug and corresponding jack and a control plug was used by the operator for answering and supervising purposes. The service was then limited to the hours between 9 a.m. and 6 p.m., and at the outset two boys were employed as operators. The service given by them, however, was poor and a trial of girl operators was made in 1887. This was successful and from that time the "Hello" girl was established in Folkestone. In 1894 the original exchange was moved to the premises just vacated. By 1898 the control was taken over by the late National Telephone Company and in 1912, when the Post Office took over the system, there existed 529 subscribers. During the war the growth in lines was slow, but the exchange became important with Folkestone as a port of embarkation for troops to the Western Front and with the location of a large rest camp in the town. At this period the staff had a very trying time, and both of the present Assistant Supervisors were invested with the Order of the British Empire. By 1921 the number of subscribers had grown to 656, and then a steady

increase of approximately 100 per annum was maintained until the change over, when 1,543 subscribers were connected to the Folkestone Exchange.

An official opening ceremony and inspection of the new exchange at Folkestone took place on June 25. The party, which numbered about 60, included the Mayor and Mayoress of Folkestone, the Mayor and Mayoress of Hythe and other prominent civic and business personages. There were also present at the ceremony the following Post Office officials:—

Colonel T. Kelly, C.M.G. (Surveyor, S.E.D.), Messrs. G. F. Greenham, M.B.E. (Superintending Engineer, S.E.D.), B. R. Mead, (District Manager), and F. H. Ball, (Head Postmaster).

Tea was provided for the visitors after they had been conducted through the apparatus rooms and switchroom by the Engineering and Traffic staffs respectively.



The photograph shows the Mayor of Folkestone speaking from the new exchange to the Postmaster-General at the House of Commons on the occasion of the official ceremony. The above mentioned officials will be discerned in the group.

LEEDS DISTRICT NOTES.

THE Leeds Traffic Office suffered a severe loss on June 24 in the sudden death of Mr. J. O. Walker, Assistant Traffic Superintendent, at the early age of 37.

Mr. Walker underwent an operation towards the latter end of 1929 and had not been too robust since. He attended the office as usual on June 23, but in the afternoon, when on a visit to Bradford Exchange, was taken ill and had to proceed home about 3 p.m. The doctor, on being summoned, called in a specialist, who had him removed immediately to the Bradford Royal Infirmary, where an operation was performed. Mr. Walker, however, died shortly before 9 o'clock on the following morning. The tragic event cast a gloom over the whole staff.

He entered the Telephone Service as a battery boy in February, 1908, at Rochdale, and his energy and enterprise were recognised by his appointment in 1919 as an Engineering Inspector. In 1922 he passed the examination which qualified him to enter the Asst. Traffic Superintendent class, and received his appointment at Rochdale on Nov. 5 of that year. On the formation of the North-Western District in 1924, with the consequent absorption of Rochdale, he was transferred to the West Yorkshire District.

Mr. Walker was appointed Exchange Superintendent at Bradford in 1926, and in February of this year he returned to Leeds in order to become the co-ordinating officer for the work in connexion with the new "On Demand" system.

He was in the army throughout the War, saw service in France and Salonika and was mentioned in despatches. Just at the Armistice he obtained his commission and subsequently joined the Royal Corps of Signals from which he resigned last year on account of his health.

Mr. Walker was deservedly popular with all grades of the Telephone Service, both Traffic and Engineering. No one who came in contact with him can forget his quickness of perception and decision. Mr. Walker was a promising officer, and his decease was peculiarly tragic in that there was

every likelihood that promotion would have come his way in the not distant future. He leaves a widow and a 10-year-old son, to whom the staff extend their deepest sympathy.

The funeral service was read at his home in Bradford prior to the interment at Rochdale. Mr. Ferguson (Head Postmaster, Bradford), Mr. Lawrence



THE LATE MR. J. O. WALKER.

(Traffic Supt.), and many other staff representatives were present. The high esteem in which Mr. Walker was held was demonstrated by the floral tributes which were sent from the District Manager's Office, the Engineering Department, and many exchanges in the Leeds, Bradford, and Rochdale areas.

The Spirit of Service.

That intangible but valuable asset of any business—and especially of the telephone business—"Goodwill," is built up or diminished by the actions of every member of the staff who comes in contact with, or has dealings with, our customers the subscribers and prospective subscribers. As an acknowledgment of the successful efforts of the staffs of all branches in creating satisfied customers, we print with pleasure a few recent extracts from our post bag:—

Contract.—Thank you for your letter of the 1st instant and also for the agreement for our telephone to be installed at ———, Leeds.

Your courtesy in this matter is very much appreciated, and the speed with which you notified us of our number has been of great service to us."

Engineering.—"We desire to express our appreciation of the manner in which you have acceded to our urgent request for a telephone extension at the residence of Mr. ———. When the fact is considered that application for the extension was made only yesterday morning, it is worthy of record that the work was carried out immediately after lunch. Please, therefore, accept our thanks and those of Mr. ——— for your prompt attention to this matter."

N.B.—The order for this extension was received at 12.35 p.m. and the work was completed at 1.40 p.m. on the same day.

Operating.—"I would like to write my appreciation for the kind manner in which one of your operators dealt with a trunk call I sent to London. The call was very complicated, and yet the patience and politeness exhibited by your operator was so that it was worthy of this letter of comment."

Accounts.—"We regret the delay in making payment which has been caused, as you will no doubt realise, by the necessary queries involved. We appreciate the very careful attention which has been given to our queries, and we are quite satisfied with the result of your investigations. Please acknowledge our cheque."

"Allow me to say that I appreciate the courtesy and promptitude of your reply to my enquiry of April 29, which reached me on May 2. Pray accept my thanks! On enquiry I find that a maid used the telephone 'unbeknownst' to the family."

Leeds Post Office Cricket Club.—In the first round of the Yorkshire Postal Cup we played Doncaster at home. Winning the toss, Doncaster decided to put Leeds in first. After their easy win over Leeds last season, Doncaster no doubt thought it a "sure thing" this time also. Leeds, however, showed some of their best form, and knocked up 119 runs, in reply to which Doncaster scored 35 runs. The second round is against Barnsley at Leeds.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

SPECIAL attention is being paid to hotels with the object of developing the idea of a "Telephone in every room." A letter has been addressed to this class of subscriber calling attention to the advantages of a comprehensive telephone private branch exchange installation. To the letter is attached a list of some London hotels which have already adopted such an up-to-date system of telephones. It is pointed out that telephones in bedrooms are part of the equipment of modern hotels and are being installed as a matter of course. Moreover, guests have the advantage of being able to make calls not only to anyone connected to the telephone system in this country, but also to the Continent, North and South America, Australia, &c., from their own rooms. In addition, the system provides means of speedy communication between patrons, hotel management and staff.

The new installation at the Dorchester Hotel, Park Lane, consists of 50 exchange lines and 530 extensions. The extensions include 396 fitted with a special hand-microphone type of instrument with electric clocks and buttons, pictorially labelled for calling the valet, boots or maid. Special lamp signalling facilities have also been provided from various points in the rooms and corridors with supervisory signals in the manager's office.

Post Office Sanatorium Society.

The L.T.S. constituency tried a new venture on Saturday, June 27, when an alfresco concert was given at the National Sanatorium at Benenden. The weather was ideal, and for over two hours the patients and staff were entertained.

Miss Nellie Beare was in excellent voice and received a specially warm welcome. Miss Evelyn Hardy's cornet solos were much appreciated and the violin solos of Mr. Phillips were well received. Mr. Arthur Brough was in fine form and the humour of Messrs. Bob Douglas and Arthur Samuels kept the audience in good spirits. Excellent duets rendered by the Misses Beare and Worth and by Miss Beare and Mr. Brough helped to add to the variety of the programme. The trying task of accompanying under difficult conditions of a glaring sun shining on the music was ably carried out by Mr. A. C. Vincent.

Dr. Spurrier, the resident medical officer, on behalf of the patients, thanked the staff of the L.T.S. for providing funds to enable the concert to be given and the artists for their excellent performance, particularly Miss Worth for the time and trouble taken in organising and carrying through such an excellent entertainment. Miss Worth, in responding, emphasised that the thanks were primarily due to the generosity of the staff of the L.T.S., and that so long as they were willing to subscribe towards the expense of such concerts she would always be happy to do her part.

Continuous rounds of applause showed the unstinted appreciation of the patients, and brought a very successful afternoon to a happy ending.

The Stamford Dramatic Society.

The "Thirteenth Chair," a play in three acts, by Bayard Veiller, will be presented on Tuesday, Sept. 29, 1931, at the Cripplegate Institute, Golden Lane, E.C.1.

Tickets may be had in advance from Miss Dorothy Coleman, Telephone School, Clerkenwell, telephone Clerkenwell 0101, or from any member of the caste.

Boy Messengers' Institute.

An interesting function took place on July 14, when the winners in the various competitions promoted by the Institute were presented by Mr. Napier with the prizes. The following were winners of the prizes:—

- A. R. J. Varney, Billiards Shield and Miniature Cup.
- J. R. Angus, Table Tennis Shield and Miniature Cup.
- E. W. Lamb, Swimming Medal.

Educational Prizes.—

- C. R. Cooley, best all-round boy.
- H. G. Vidler, for greatest progress.

The boys are to be congratulated on the interest they take in the various activities of the Institute, and it is hoped that the number of entries for the competitions and prizes next year will be considerable.

Presentation to Mr. E. A. Pounds.

A large number of colleagues gathered together in the Refreshment Room, Cornwall House, on the evening of Friday, July 17, to bid Mr. Pounds, who retires from the service on July 31, an official farewell.

The proceedings commenced with a parodied version of "Come to the Fair," sung by Mr. Arthur Hemsley, to the words furnished by Miss McMillan, as follows:—

Tune—"Come to the Fair."

Come, Ladies and Gentlemen, list to my lay.

Heigh-ho! Sing a sad song.

No longer we're happy, light-hearted and gay.

Heigh-ho! Sing a sad song.

In the West Central District they do not disguise

Each morning they're dancing with tears in their eyes;

For we've come, then, maidens and men,

To the date that we're all so much dreading;

And our Mr. Pounds is soon going away.

Heigh-ho! Sing a sad song.

At Tandem in sackcloth and ashes they're clad.

Heigh-ho! Sing a sad song.

At Holborn there isn't an ash to be had.

Heigh-ho! Sing a sad song.

At Chancery, Temple Bar, Terminus, too,

Museum and Fitzroy, they're terribly blue,

While at Welbeck, maidens and men

Are weeping all over the relays

And at Gerrard and Regent they're sobbing like mad.

Heigh-ho! Sing a sad song.

So, Ladies and Gentlemen, list to my lay.

Heigh-ho! Sing a sad song.

It's far from a joyous occasion to-day.

Heigh-ho! Sing a sad song.

But though far in the country, dear Uncle may go,

He will not escape us, we'd like him to know,

For we'll all be imploring the railway

For daily excursions to Welwyn,

So give him a send-off that's cheery and gay.

With a heigh-ho. Sing him a song.

Maidens and men. Maidens and men.

Soon we'll be meeting at Welwyn.

Heigh-ho! Sing him a song.

Then Miss Peggy Murray charmed us with a song from "The Rebel Maid" and our young friend Mr. John Angus sang another parody by Miss McMillan, quite in the vein of the telephone play she presents to us each year.

It is worthy of a place in this report:—

Tune—"Betty-co-ed."

We're here to-night to honour our producer,

We're happy when we see his smiling face.

And now because he's leaving,

All the boys and girls are grieving,

For there's no one who can ever take his place.

Dear Mr. Pounds, we wish you all good fortune,

May you have luck in everything you do.

And though the time has come for you to leave us,

You know we'll always think a lot of you.

Dear Mr. Pounds, our hearts are filled with sadness,

To part from you brings thoughts of grief and pain,

So if you want to cheer us up and make us glad,

Just promise you'll come back again and again.

So take with you the heartiest of wishes,

May all your days hold happiness and joy,

And when again we meet you,

We'll with true affection greet you,

For you've won the heart of every girl and boy.

Dear Mr. Pounds, oh, say you won't forget us,

We shall be sad until your smile we see,

We shall remember how you've always helped us,

And think of you wherever you may be.

Dear Mr. Pounds, you'll soon be growing roses,

And watching blossoms wonderful and strange,

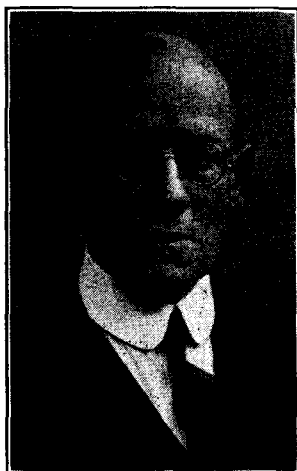
But when you're walking round you garden, don't forget,

You've left the fairest roses in the exchange.

Mr. Pink then proceeded to make the presentation. He first of all read a letter from the Controller apologising for his absence and wishing Mr. Pounds much happiness in his retirement. Reference was made to Mr. Pounds' 43 years' service in the Post Office, his Peter Pan appearance, his cheeriness in times of difficulty, and his flair for getting to know people. He was beloved by the staff and we shall all miss him. Mr. Pink then presented Mr. Pounds with a cheque from his colleagues, including the night operators.

Miss Cox, in handing Mrs. Pounds a tapestry hand-bag from the women in the service, paid a tribute to the part she played in co-operating with Mr. Pounds in the social and entertaining life of the service.

Mr. Dive also joined in expressions of appreciation of the valuable services rendered by Mr. Pounds. He said: "The more you know him, the more you see him, the more you like him."



MR. E. A. POUNDS.

An ovation was given to Mr. Pounds when he rose to reply. He reminded the audience of the heroic conduct of the operating staff both during and after the war.

In the latter connexion he spoke in gratitude of the work done in entertaining wounded soldiers. He added that while he had not any regrets in saying good-bye to telephones, it was sad having to part with so many friends. Referring to the cheque for £65 presented to him, Mr. Pounds felt it was much more than he deserved, but he would ever remember such a magnificent gift.

He thanked everybody for all they had done, particularly the Committee who arranged the gathering, Miss James, Miss Goodway, Messrs. W. J. White and E. A. Durrant.

After an interval for refreshments another short musical programme was given by Misses Garvie, Tilling and Cheason and Messrs. Hugh Williams, Beal and Cracknell.

"Auld Lang Syne" and "The King" brought a memorable evening to a close.

Personalia.

Resignations on account of Marriage.

Telephonists.

Miss E. I. Roach, of Thornton Heath.	Miss A. E. M. Docura, of Holborn.
" M. Pullen, of New Cross.	" O. J. Nash, of Croydon.
" E. F. Hulks, of Hampstead.	" D. E. Ball, of Chiswick.
" I. F. Stevens, of Brixton.	" E. D. Holloway, of Reliance.
" I. L. Allbutt, of Woolwich.	" D. L. Bosomworth, of Reliance.
" M. Marian, of Sydenham.	" C. B. Liddle, of Tandem.
" E. M. Bolting, of Hop.	" V. R. Reeves, of Tandem.
" E. V. Ward, of Hop.	" A. P. George, of Greenwich.
" A. P. E. Evans, of Hop.	" R. E. Thurbon, of Mountview.
" E. M. Matthews, of East.	" W. A. Mason, of Mountview.
" E. K. Cole, of Avenue.	" F. B. Smith, of Trunk.
" D. B. Sellman, of Avenue.	" D. E. De Ville, of Trunk.
" F. A. Brinsdon, of Avenue.	" N. Landeg, of Trunk.
" M. E. Kellman, of Avenue.	" A. A. J. Tesorière, of Trunk.
" D. I. Stevens, of Clerkenwell.	" E. E. C. Morley, of Trunk.
" H. A. Cornwall, of Mayfair.	" O. W. Stillwell, of Ealing.
" M. E. Hutchins, of Mayfair.	" N. Feltham, of Flaxman.
" O. M. Sheppard, of Wimbledon.	" N. M. Hunt, of Paddington.
" B. Long, of Maryland.	" A. E. Mawby, of Paddington.
" E. A. J. Sanders, of Victoria.	" I. M. Payne, of Paddington.
" D. F. Pelters, of City.	" H. K. Masters, of Beckenham.
" D. V. Willomatt, of Toll "A."	" V. R. Berry, of Central.
" A. L. Waller, of Toll "A."	" E. M. Robins, of Central.
" M. M. Murrell, of Toll "A."	" A. F. M. Hope, of Central.
" L. A. Hales, of Grangewood.	" I. L. Shimmings, of Central.
" D. L. Neeve, of Grangewood.	" G. Wright, of Central (F.E.S.).
" I. Wilson, of Royal.	" E. E. Ackford, of Western.
" E. D. M. Cheeseman, of Albert Dock.	" S. M. Cowan, of Enfield.
" C. E. Allen, of Holborn.	" R. M. Nicholson, of Welbeck.
	" E. E. Storer, of Mitcham.

GLASGOW TELEPHONE NOTES.

Miss I. H. Brunton.—Miss I. H. Brunton, the subject of our sketch, entered the service of the late National Telephone Company as a Telephonist. Two years after the transfer of the telephones to the Post Office she was promoted to Assistant Supervisor, Class II, and she is at present in charge of the rapidly growing Langside Exchange. During her period of office at this exchange, Miss Brunton has been successful in maintaining a good service, notwithstanding the interruptions incidental to cable alterations on a large



MISS I. H. BRUNTON.

scale, transfers of large groups of subscribers to a neighbouring new exchange, and extensions and alterations to the switchboard and premises. Miss Brunton possesses those gifts of personality and tact which inspire confidence in both staff and subscribers.

Weddings.—Miss G. McHugh, Telephonist, South Exchange; Miss M. Horrocks, Telephonist, Trunk Exchange.

Golf.—The annual inter-office Golf Match between the Glasgow and the Scotland West offices, was held on June 26. Glasgow won by 3 games.

Fishy!—In some islands of the South Seas, says the *Victoria Times*, fish are still used as currency. Reiditski says it must be a messy business passing a phone call from a prepayment call office.

On Censure.—I am told that the junior clerks in my department regard me as a demi-god, raised high above law and discipline. Yet this morning I received a letter from my political chief which makes me feel like a fifth-form boy under the lash of a schoolmaster. My chief, I gather, has received a letter from the prime minister which makes him feel like an usher who has been reprimanded by a headmaster; and the prime minister probably has received a letter from the sovereign which makes him feel like a footman who has been scolded by his mistress. Now I shall go home and scold my cook, who will certainly scold the kitchen maid. Such is the link which binds the highest and humblest; but the kitchen maid, I hope, will feel less mortified than I do.—(Bagshot.)

No might nor greatness in mortality can censure 'scape.

(Julius Caesar.)

The interests of the service are best served by avoiding any tendency to seize upon every petty irregularity observed, as an opportunity to correct the operators.—(N.T.Co. Circular.)

Take each man's censure, but reserve thy judgment.—(Hamlet.)

But, brother, let your reprehension, then,
Run in an easy current, not o'er high,
Carried with rashness or devouring choler,
But rather use the soft persuading way,
Whose powers will work more gently, and compose
The imperfect thoughts you labour to reclaim;
More winning, than enforcing the consent.—(Ben Johnson.)

It is not meet

That every nice offence should bear his comment.

—(Julius Caesar.)

He whom you have to punish by deeds should not be flagellated with hard words. The pain of his penalty is sufficient for the poor creature without the indignity of abuse.—(Cervantes.)

Those that do teach young babes
Do it with gentle means and easy tasks.
He might have chid me so; for in good faith,
I am a child to chiding.—(Desdemona.)

On the top is Mossos, the governor, with a heavy club to rap the staff; the staff, for revenge, canes the soldier; the soldier clubs the settler, and he hammers the Arab; the Arab smites the negro, and he takes it out of the donkey. The poor bourriquot, having nobody to belabour, arches up his back and bears it all.—(Daudet.)

From all rash censure be the mind kept free,
He only judges who weighs, compares,
And in the sternest sentence which his voice
Pronounces ne'er abandons charity.—(Wordsworth.)

Let our just censures
Attend the true event.—(Macbeth.)

Know your own consequence; and be not ashamed to say or do anything which you think agreeable to nature and reason; and be not deterred from acting properly, on every occasion, by the censure or remarks of other people. But whatever appears to you fit and honourable to be said or done, do not demean yourself by shrinking from the performance.—(Aurelius.)

No man can justly censure or condemn another, because, indeed, no man truly knows another.—(Browne.)

While we often hold lightly the praise of those upon whose powers of judgment and reach of information we place little value, by some strange contrariety we feel most bitterly the censure of these very people whenever any trivial circumstance, any small or petty observance with which they are acquainted, gives them for the time the power of an opinion. The mere fact of our contempt for them adds a poignancy to their condemnation, and I question much if we do not bear up better against the censure of the wise than the scoff of the ignorant.—(Lever.)

NORTH WESTERN DISTRICT NOTES.

Preston.

OUR congratulations are offered to Mr. J. S. Blake (Assistant Traffic Superintendent) who has been nominated to the Assistant Surveyor class and who took up duty at Shrewsbury on July 20. Mr. Blake has a personal gift which will be an asset to him throughout life, e.g., he knows his own mind and is not afraid to act on his decisions. The staff at Preston will miss him, but our loss is the Surveyor's gain, and it is all for the good of the Service.

Cricket.—The Preston District Manager's Office Cricket Team, playing in the Head Postmaster's shield competition, after surmounting the first hurdle at Lancaster against the Lancaster Post Office, came a "cropper" at Blackburn. A keen game resulted in a win by Blackburn Post Office by 5 wickets.

Golf.—An interesting Golf meeting was held at Preston on the Fulwood course, on Friday, July 10. Mixed foursomes were arranged amongst the staffs of the District Manager's Office for prizes raised by subscription. The winners were—Miss Maden and Miss Lewty—who were partnered by Mr. Pybus and Mr. Walmsley. The gross scores are not for publication, but the weather was excellent.

Tennis.—In the N.W. District Tennis Shield Competition two teams from the District Manager's Office were entered. B team was eliminated early, but the A team are like "Charley's Aunt."

The result of the 1st round was as follows:—

- A Team beat Preston P.O. 4 sets to 2.
- B Team lost to Chorley P.O. 4 sets to 2.

District Manager's Office Tournament Result.—Men's Singles—won by Mr. W. Walsh (Traffic Section). Ladies' Singles—Misses Hopkinson and Howarth are in the final. They are going to play off when it stops raining.

Blackpool.

We are pleased to welcome Mr. R. S. Campbell as the new Head Postmaster of Blackpool. Mr. Campbell comes to the district with a very high reputation and will, we are sure, be a worthy successor to Mr. Tanner, who has left us to become Head Postmaster of Oxford.

"Tell the World"—Extracts from Subscribers' Letters.

[Cutting from "Blackpool Gazette."] Sir,—In the course of my duties, I had to attend a fire at Hawes Side, in the early hours of to-day. I had two telephone calls to put through to your office, and I should like to pay tribute to the smartness with which the operators made the connexions. There was no delay at all.

[Cutting from "Blackpool Gazette and Herald."] Sir,—Through your paper I would like to thank the Telegram Department of Blackpool for their kindly assistance over the phone to me. Being at a loss to understand the telephone, I made a blunder by pressing the button too early. My error was corrected in a most courteous manner. I had occasion to use the phone for three

different calls, and can honestly say I shall never have to fear the Telephone Department in case of an error, which I trust will not occur again. —Yours, &c., "GRATEFUL ENCOURAGER."

Morecambe.

"Last night, about nine o'clock, we had occasion to telephone an item of news to five daily papers in Manchester and Leeds, and the refreshing alacrity with which these calls were put through to us not only gave us pleasure, but prompts us to write to you to offer our congratulations and thanks to the operators concerned."

SHEFFIELD NOTES.

Cricket Match v. Nottingham.—One word, all too familiar in cricket talk, is sufficient to describe the match—"Raining." Perhaps it was too much to expect a fine day in June! We hope to placate the "Controller of Weather" in time for the return match at Nottingham.

Marriage.—On June 23, after 17½ years' service, Miss M. Renshaw (Clerical Officer) bade adieu to her many friends in the Sheffield Office. The District Manager, Mr. S. R. Vaughan, on behalf of the Staff, presented her with an electric standard lamp, as a material expression of our regard, coupled with the best wishes of everybody for a happy and successful future.

Honor Virtutis Praemium!—Compliments are so infrequent that we beg to be excused for recording the following:—

A visitor, on leaving the town, took the trouble to dial "O" specially to tell the operator that, although he had been in practically every town in England, he considered the service in Sheffield to be the best he had ever experienced.

SOUTH WALES DISTRICT NOTES.

A MOST interesting and instructive lecture, illustrated by lantern slides, was given by Mr. J. F. Darby (Secretary's Office, Telegraph and Telephone Section), in the South Wales Institute of Engineers, Cardiff, on May 1, the subject being "American Methods of Handling Long Distance Telephone Traffic" and the possibilities of adaptation to the British Telephone System.

The chair was taken by the Surveyor of the South Wales District, Mr. C. A. Jackson. The District Manager, Mr. B. Waite, together with the Superintending Engineer, Mr. J. S. Terras, and the Asst. Superintending Engineer, Mr. H. J. Hunter, also other engineering officers, were present. There was a splendid general attendance of over 150, including a large number of Supervisors and Operators from Cardiff, Newport, and several other exchanges.

At the conclusion of the lecture the Surveyor, in well chosen words, invited questions and a general discussion. This was opened by Mr. Waite, District Manager, and Mr. Grosvenor, Traffic Superintendent I, followed by a number of Traffic Officers, Supervisors, and Operators, and the points raised were fully answered by the lecturer.

A very enjoyable evening, which was all too short, came to an end with a hearty vote of thanks to Mr. Darby for his very lucid lecture.

A representative staff gathering was held at Barry's Hotel, Cardiff, on May 2, to bid an official farewell to Mr. MacDonald, Traffic Superintendent II (Telephones) South Wales District, on the occasion of his retirement. Mr. MacDonald has completed 44 years in the Telephone service, having joined the ex National Telephone Co., Ltd., at Aberdeen in 1887. After being stationed at Aberdeen, Peterhead, Leith, Inverness, Bolton, and Northampton, he was transferred to the South Wales District in 1915.

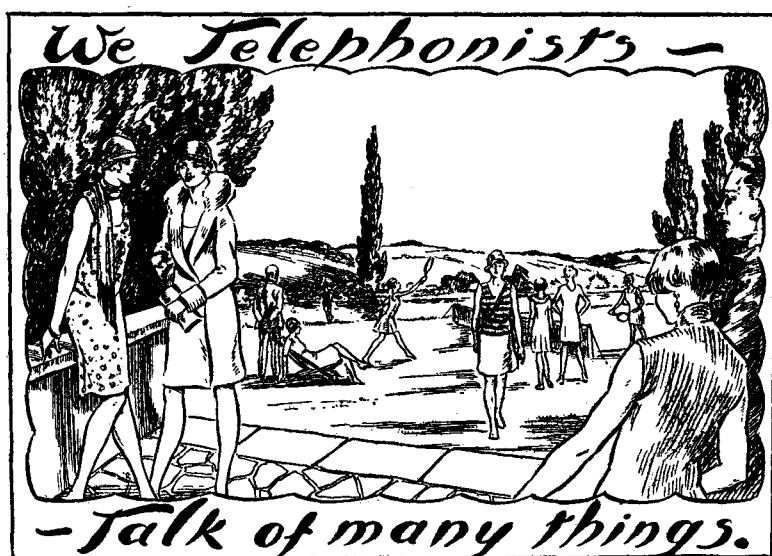
Mr. MacDonald became very popular and proof of this was forthcoming when the District Manager, Mr. B. Waite, presented him with a 3-valve wireless set, loudspeaker, and all accessories. Miss Spearing, Supervisor, Cardiff Telephone Exchange, on behalf of the Exchange staff, also made a presentation of a complete set of lawn bowls in a handsome leather case, and to Mrs. MacDonald a cut glass flower bowl.

A most enjoyable evening was spent, presided over by Mr. R. S. Grosvenor, Traffic Superintendent I, and amongst many speeches, messages of congratulation and good wishes were those contributed by Mr. E. Ogden, Sectional Engineer, Newport, and Mr. W. J. Marsh, retired Traffic Supt. I, with whom the guest of the evening was associated for over 15 years.

Staff Changes.—Miss Wilkes, Writing Assistant in the Accounts Section of the District Manager's Office at Cardiff, has successfully passed the clerical officers examination and has been appointed to the Ministry of Labour, London.

Before leaving, the staff presented her with a wristlet watch as a parting gift.

Miss D. C. Fraser, Writing Assistant, also at the Accounts Section, has left the service for marriage, and received a canteen of cutlery as a token of esteem. Our best wishes go to both of these officers.



"A Written Complaint."

CLOAKING her vitriolic pen in the fair words of "Renrut," in our last issue, the Editress stabs me in the back like a snake in the grass or a serpent in the bosom. If you question her dexterity and ask me how she did it—I don't know. But the fact that I have mixed my metaphors just a little shows how the iron has entered the soul and frozen me to the marrow with innuendo. For what did I see on reading "Renrut's" article?—the words "It makes one so independent of mankind's help" to which the Editress had added stealthily, "Percy Flage, please note." Behold me, then, knitting my teeth, grating my brow, and unsheathing my pen with a clenched fist, having in the meantime assumed a green—no, a grim look of extermination—I mean, determination. Oh yes, and I am quivering with rage, but I expect the printer will put "sage," and so make the whole thing appear ridiculous.

Things being as they were, I grabbed the telephone and poured into it an impassioned flood of protest. Having paused for breath I was met with a voice charged with that calm, soothing, gentle, bedside tone, peculiar to complaint officers on the information desk, and which is so enraging to the man who is simply bursting to have a row, and it asked me what was my trouble. I replied by going purple—it was the only adequate reply in the infamous circumstances. I realise, of course, that if I had been making much ado about nothing it would have been very foolish to act like a tempest. (That's Shakespeare: rather clever to be able to quote large portions of poetry like that from memory, don't you think: makes one seem quite erudite, doesn't it!) Then resuming my niagaric flood, I said "But this isn't about nothing. Oh, no, indeed. This is a very serious matter and I shall not let it rest here. I am not without influence (I said this very loftily and with a touch of monocolle in my voice): the Postmaster-General shall hear of it and I shall have the matter thoroughly—I repeat—thoroughly ventilated in Parliament and in the public Press. The thing is a positive scandal: everyone ought to be sacked: overpaid parasites: batten on the public. What's that! Don't interrupt: have you no manners: I am about to tell you the substance of my complaint and I want you to take particular note of the circumstances because you will hear further about the matter. Are you listening? But I can see that it's not the slightest use to talk to you. You all hang together and shield one another." Rumble, grumble, snort.

I replaced the receiver with a bang and decided to write. But to write, one must have the pens, the ink, and also the paper, as they say in French exercise books, even though these articles are, most unaccountably in the possession of the gardener's daughter. So I barked out to Camou, "Why is it that whenever I want to write, there's no ink, pens, and paper? Why the dev—dickens can't a man find—what! ink, where—oh well, it wasn't there when I looked. Where's the paper? No, no, not the newspaper, the paper. I want to write a letter! Oh, ah, well, who put it there. And where's my pen! I never can keep a pen in this house. I declare I ought to keep all the blessed things under lock and key. What nonsense, you must have seen it: I had it a moment ago: clearing up and tidying: perfect mania: where—what! behind my ear! Well, why couldn't you say so sooner, instead of standing there helpless! Yes, yes, don't keep on disturbing me, can't you see I'm busy?"

Now then for it. "Independent of mankind's help," indeed. I'll show them who is independent.

PERCY FLAGE.

With thanks to *Punch*, we print the following, taken from a recent number.

"Nan."

(A correspondent suggests that in order to avoid the well-known confusion between the numbers "five" and "nine" the latter should in future be universally pronounced "nan.")

I'm not, I hope, a die-hard,
In fact, I'm in the van
Of those who really try hard
With swarms and swarms
Of well thought-out reforms,
To ease the lot of man.
But here is where I'm forced to draw the line—
I do not think I can
Stand meekly by and hear the number "nine."
Being pronounced as "nan."
O nine! O number mystic!
O holy three-times-three!
O symbol cabalistic
By priest and sage
In every cultured age
Revered on bended knee—
Never, I swear, while I am still alive,
By any base decree,
Shall you (because you sound a bit like "five")
Profaned and garbled be.
Because the fool confuses
His words where'er he can,
Shall the immortal muses
By mincing tongue
Of poetasters young,
Be called the "Tuneful Nan"?
And shall we at a "Nan days' wonder" stare?
And shall Matilda Ann
From her sententious copy book declare
"Nan tailors make a man"?
Nay, nay! Let Five (a cipher
Devoid of sacred lore)
Be known as "fife" or "fifer,"
Or even let
Us uncomplaining get
Wrong numbers by the score—
Yea, let some unseen power strike us dumb
With decent shame before
We say "Lars Porsena of Clusium
By the nan Gods he sware"

There was a young lady on Langham,
When she asked for her numbers she sangham,
Her tunes were pathetic
And so sympathetic,
Telephonists wept as they rangham.

R. C.

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLOUCESTER NOTES.

Lecture by Mr. J. F. Darby, of Headquarters.—On May 21 an audience composed of representatives of all sections of the Post Office staff at Gloucester, and a number of the operating staffs of exchanges in the Gloucester telephone district, were interested for two hours by Mr. J. F. Darby, of the Headquarters Traffic Section, who delivered a lantern lecture on "Long Distance Telephony."

The lecture was based principally on the explanation of the American system of demand working on long distance routes, and the application of its principles to the trunk service in our own country. To those of us who have in any way endeavoured to explain and even justify the inherent delays of our present trunk system, the realisation of the improvement which the demand system will effect has given a satisfaction which will only be equalled by that of our customers.

An all-too-short time was allotted for questions at the conclusion of the lecture and the variety of the questions indicated the aspects of the service which most impressed the members of the various sections. The thanks of all present to the lecturer for his interesting and instructive address were expressed by Mr. John H. Storrie, the District Manager, and Mr. Darby responded.

More lectures of this nature by experts in particular branches of the service would be keenly appreciated by all members of the staff. Information such as that imparted by Mr. Darby inspired the staff with confidence in the excellence of the British telephone service and enables each member to do his or her job more efficiently, especially when that job involves direct contact with subscribers.

Retirement of Miss C. J. Harrhy.—On Feb. 22 last, Miss C. J. Harrhy, Assistant Supervisor, II, at Gloucester Exchange, retired after 32 years of service. Miss Harrhy entered the service of the late National Telephone Company in 1899 expressly for the purpose of taking charge of the Gloucester Exchange, her period of training prior to taking up duty being spent at Bristol. She continued in charge of the local exchange until the conversion to automatic working in 1927, when she became the senior Supervising Officer of the combined manual exchange. During the whole of that time she displayed remarkable vitality, and even at the time of her retirement she possessed the mental and physical energy which one expects only from a person in the prime of life.

She was beloved by all the operating staff under her control, and her presence will be sadly missed at the Gloucester Exchange. She was also respected and esteemed by all who had occasion to work with her in any capacity.

The staffs at the Exchange, Sectional Engineer's Office, District Manager's Office and the Head Post Office contributed liberally towards a suitable present for so popular a colleague. Her departure was, however, unmarked by any public expression of regret, for Miss Harrhy had asked that a public presentation be dispensed with. Accordingly a sum of money was handed to her privately in her home.

Immediately after her retirement Miss Harrhy suffered a bereavement in her family and this was followed by her own illness, which necessitated surgical treatment. We are, however, pleased to be able to record that she has made an excellent recovery and we hope that she will enjoy good health and many happy years of well-earned rest.

SOUTHAMPTON NOTES.

Presentation to Mr. H. C. Pinch.—His friends outside the Southampton District will be pleased to know that on June 3, Mr. H. C. Pinch, Assistant Traffic Superintendent, joined the married ranks. The day before the nuptial ceremony members of the District Manager's Office gathered in the Traffic Section to wish Mr. Pinch every happiness in the future, and to witness the presentation of a case of cutlery—a tangible expression of their good wishes. It was unfortunate that the District Manager, Mr. O. G. Lee, and the Traffic Superintendent, Mr. R. Williamson, were unavoidably absent, but Mr. J. W. Stelling, Traffic Superintendent, Class II, very ably filled the gap and presided over the gathering. Mr. Stelling was in a happy mood. He said that many ceremonies of this nature were for the purpose of saying good-bye to departing colleagues, and were therefore attended by a note of regret. On this occasion, however, there could be nothing but happiness, and it gave him great pleasure to make the presentation. Mr. Stelling congratulated Mr. Pinch on the step he was about to take. Few people could speak with more experience of married life, and he spoke confidently of the unbounded happiness to be found in successful marriage.

Mr. H. R. C. Hickish, Assistant Traffic Superintendent, supported and endorsed all that Mr. Stelling had said about the married state. He wished Mr. Pinch and the future Mrs. Pinch health and prosperity in the future. Mr. C. Weston, Staff Officer, Accounts Section, Mr. W. Townsend, Clerical Officer, and Miss M. Affleck, Officer-in-Charge of the Typist Section, also wished Mr. Pinch "Good Luck."

Mr. Pinch was the recipient of a number of individual gifts from members of the staffs of the District Manager's and Sectional Engineer's Offices. Mrs. Pinch was on the staff of the Southampton Telephone Exchange before her marriage, and her colleagues presented her with a tea service.

Presentation to Mr. A. H. Hickman-Clarke.—On the occasion of the departure of Mr. Hickman-Clarke, Contract Officer, Class I, Portsmouth, to his new appointment as Contract Manager at St. Albans, Mr. D. Wallace, Contract Manager, in the presence of the Contract Officers of Portsmouth, presented to Mr. Clarke, a handsome chiming clock, subscribed for by the District Manager and staff.

Mr. Wallace said that without doubt Mr. Clarke's personal abilities, his circumstances and fairness had helped to make him greatly liked and admired by all with whom he came into contact. Mr. Douthwaite, Contract Officer, backed up Mr. Wallace with some very appropriate remarks.

Mr. Clarke said how sorry he was in having to leave his many friends of the South, but hoped he would always enjoy their friendship. In any case, he added, the clock would be a very charming reminder to him of the friends of his old district. It would hold a very prominent position in his home and, depend upon it, all visitors would know by whom it was presented.

Mr. Clarke left the Southampton District to take up his new appointment on May 26, 1931, and we wish him every success and good luck in his new position.

LONDON ENGINEERING DISTRICT NOTES.

Oxford Street Traffic Signals.

A good deal of attention has been directed to the new traffic control signals which have been put into operation in Oxford Street. It is not generally known that the Post Office Engineering Department have done a good deal of work in connexion with the provision of the system.

The section of the thoroughfare controlled by the signals extends from the Marble Arch to St. Giles's Circus. Nineteen signal posts have been erected at the principal crossings in Oxford Street. These signal posts have the usual three lights—red (stop), amber (caution: prepare for the next signal) and green (go). These are operated by a chronoliser from a central point in Oxford Circus. This is an automatic control which works the lamps in the successive posts on a time interval which permits the main traffic to proceed along Oxford Street at a uniform speed, and releases successfully the cross traffic at the various points. The system is ultimately designed to pass traffic forward at the rate of 20 miles per hour.

At the Marble Arch, St. Giles's Circus and three other important points, secondary controllers have been erected, with means for telephonic communication with the central control. The latter is housed in one of the Department's kiosks, painted blue. The object of the secondary controllers and the telephones is to enable unforeseen traffic emergencies to be dealt with which would require the automatic control to be varied or suspended. Telephones have also been provided between the central control and the Marylebone Lane and Tottenham Court Road police stations. The cable used for the connexions between the main control at Oxford Circus and the secondary controls consists of a special 5-core lead-covered cable, which was supplied by and drawn in by the Post Office staff, using space in one of the conduits allotted for telephone cables. To distinguish it from the latter the special cable has been painted blue. The kiosk at Oxford Circus (which was provided by the Department) accommodates, in addition to the apparatus for controlling the signals, the switchboard and batteries for the telephone circuits to the sub-controllers and to the police stations.

The signalling apparatus was supplied by the Metropolitan Vickers Co., and the electric light wiring to the controller apparatus and signal posts by the Borough of Marylebone Electric Light Department.

Sanderstead Exchange.

Another exchange to cater for the ever-growing number of subscribers in London's residential districts was opened successfully at Sanderstead, Surrey, at 1.30 p.m. on Wednesday, July 15. The exchange, manufactured by the General Electric Company, Ltd., has an initial capacity of 1,800, with 10,000 ultimate. 771 subscribers from Purley, Croydon and Upper Warringham were transferred and 82 junctions, including order wires, brought into use.

V.F. Keysending from "A" Positions.

With regard to the paragraph in the Manchester notes of the July issue on the proposed introduction of 4-digit and 7-digit V.F. keysending from East Exchange, our Manchester friends will no doubt be interested in the paragraph on the same subject in the London Engineering District Notes, April, 1931. The work of converting nearly 2,400 positions at 64 manual exchanges is well in hand, and it may be of interest to know that at least 60 exchanges will have to be completed before the first few automatic exchanges can be transferred to this method of working.

Staff Notes.

Promotions.—Mr. E. V. Smart, Executive Engineer, to be Asst. Superintending Engineer, and Mr. W. J. Gear, Asst. Engineer, to be Executive Engineer. We tender these two gentlemen our heartiest congratulations.

More L.E.D. Swimming Successes.

Civil Service v. Cambridge University.—The match resulted in a draw of 15 points each. The outstanding feature of the meeting was the great performance of A. W. Churchill (I.C.T.), who beat the Cambridge first string by nearly 2 lengths in the 450 yds. race in the excellent time of 6 mins. 29 secs.

W. F. Hunter (I.S.E.) also put up a very fine performance in swimming Newbold, of Cambridge, to 1 ft. in the 50 yds. dash. Hunter's time of 27 secs. shows that he could hold his own against any sprinter in the Civil Service.

The Civil Service ¼-mile Championship was decided in open water at Tooting on July 6.

A. W. Churchill (one of the favourites) could not start.

L.E.D., however, supplied a winner in D. K. Brenton (I.C.T.). This was a great surprise, for although Brenton has always done well in this event, H. F. Crow (I.N.E.), the holder, was expected to retain the title, but could only finish 4th.

J. M. E. Bowen (I.C.T.) was 5th, C. E. Green (X.S.W.) 8th, F. E. Plumpton (Circuit Laboratory) 9th, and W. F. Hunter (I.S.E.) 10th.

Six places out of the first 10 in a Civil Service Championship is a very creditable performance.

In the *London Business Houses A.S.A. League*, L.E.D. are second, having swum 8 and won 6.

The losses were against the Gas Light Co. (away) by a touch, and to Amalgamated Press by 3/5ths seconds. In the latter race the Amalgamated Press put up a record time of 1 min. 9½ secs. for 133½ yds. to beat L.E.D., who did 1 min. 10 secs., which also beat the late record of the competition.

The L.E.D. team is H. F. Crow (I.N.E.), L. A. Nes (Terminus), W. F. Hunter (I.S.E.) and F. Broadley (X.N.W.) with H. F. Smith (Museum) as 1st reserve.

L.E.D. Amateur Sports Association.

The first general meeting of the Association was held at Denman Street on July 15.

The following were elected officers for the ensuing year :—

President.—Mr. E. Gomersall, O.B.E., M.I.E.E.

Vice-Presidents.—Deputy Superintending Engineer and all Assistant Superintending Engineers, Executive and Sectional Engineers and Principal Clerk of the L.E.D.

Chairman.—Mr. P. J. Ridd.

Hon. Treasurer.—Mr. V. G. Leader.

Hon. Secretary.—Mr. A. W. Kelly.

Committee.—Misses Fuller, Brunsden, and Cooke, and Messrs. Rees (I.C.Y.), Clarke (Hqrs.), Head (I.S.E.), Hornsby (I.N.E.), Percival (I.S.E.), Juniper (X.S.W.), Gaby (I.C.T.), Green (X.S.W.), Belleini (I.S.E.), Cowley (I.C.T.), Westwood (X.C.Y.), Cornwell (Hqrs.) Ratcliffe (I.N.E.), Eadon (I.S.E.) and Bridgen (I.S.W.).

Messrs. Maddocks (I.N.W.) and Futerman (Hqrs.) were elected as auditors.

WESTERN DISTRICT NOTES.

The telephone is daily taking a greater part in Press work. The following is culled from the *Western Morning News* in relation to the recent Hearn case at the Bodmin Assizes :—

"Each day a corps of six reporters was engaged taking a verbatim note of the proceedings, each taking a shorthand note for five minutes, leaving him 25 minutes to transcribe that shorthand; and so it continued throughout the eight days. The "copy" was rushed to the telephone as it became ready, and there it was dictated to a highly-skilled typist, who himself received practically the whole of the 130 columns! There were some days when 20 columns of news were dealt with in this way, and there were times when five columns of "copy" were typed in an hour, representing a speed of 75 words a minute maintained, it should be noted, for many hours each day. In all the telephone was used for about 35 hours, and practically throughout that time the typist, wearing head-phones, was at work."

Special telephone arrangements had been made for the *Western Morning News* and other newspapers.

Birthday Honours.—The Birthday Honours list, published last month, contained the O.B.E. for an Exeter Territorial Officer, Major James William Western (T.D.) Royal Corp of Signals, Territorial Army. Major Western is in the Western District Surveyor's Office, and has been associated with the Volunteer and Territorial movement in Exeter for the past 35 years. He joined "A" Company 1st R.V. in November, 1897, and subsequently the Territorial Force, and during the Great War saw service overseas and had the distinction of being mentioned in despatches.

On a traffic officer visiting the telephone exchange at Bigbury-on-Sea, he noticed that since his last visit the establishment had been increased by 13 chickens and two ring doves. One wonders whether the doves were attracted to the place by another type of rings.

A severe storm broke over Exeter and the surrounding villages on July 7. Outside the small Post Office at Rewe, near Exeter, there is a public kiosk. At about 3.10 p.m. a terrific flash of lightning struck the telephone kiosk, tearing off part of the roof and putting the instrument out of action. It then appears to have entered the Post Office at the front door, smashing the glass panel and creating a cloud of smoke. Mrs. Baker, the Sub-Postmistress, had to receive medical attention for shock. The back door of the Post Office was also damaged.

At the adjoining village of Stoke Canon the Exchange was put entirely out of action.

Is it true that we hear a larger type of kiosk is about to be introduced for corpulent persons, who find that when they enter the present kiosks button "A" is permanently pressed?

To those whose duty confines them to the more congested parts of the country, the following incident in the life of a traffic officer in the wilder parts of the country may be of interest :—

On the 7th instant, the writer, in company with two officers who were also concerned, left headquarters by motor car for the opening of a Rural Automatic Exchange about 30 miles away. Throughout the journey it was evident that a violent storm could be expected, but seemed to remain stationary.

The Exchange was duly opened, to the accompaniment of discharges on the lightning arrestors. After finishing our business we were proceeding to another exchange distant about 20 miles over some wild, hilly country. We had only left the new R.A.X. behind about a mile, but it was impossible to go back as the lane was only the width of the car and up-hill, when without warning the storm broke in great violence. In a moment the road was flooded and it was almost impossible to see through the rain, the wind screen continually steaming over inside, and the blinding flashes of lightning around the "all steel" car making it anything but a comfortable position.

Just as it became practically impossible to proceed further, we came to a cottage where shelter was obtained. After the storm had passed, we ran into another, similar, and again shelter had to be obtained, this time in a village smithy. After this storm had passed we ran into a third and this time obtained the shelter of a Head Post Office.

F. J. F.

MANCHESTER NOTES.

Manchester Automatic Committee.—We were pleased to hear of the promotion of Mr. Crum to the London Telephone Service. Mr. Crum has been Chairman of the Manchester Automatic Committee since its formation, and he has been of great help in dealing with the many problems arising at these meetings. We wish him all happiness and prosperity in his new sphere of work.

Partial Pegging of Large Multiples.—The pegging of a large multiple at a partial transfer of subscribers is no small work, and the following may be of interest to readers. In connexion with the recent opening of the Blackfriars Automatic Exchange, it was necessary to peg the multiple at the Manchester City and Central Exchanges of those subscribers who were transferred to the new automatic exchange, as also those connected to Blackfriars Hypothetical Exchange, which works on Central Exchange. Immediately after the transfer was effected, at 1 p.m. on June 13, a small army of telephonists and assistant supervisors set to work pegging the multiple. The number of black pegs used was 126,000, and 49,836 pink pegs. Of the latter, 7,900 bore the changed number of those Central and City subscribers who were transferred to Blackfriars. The pink pegs bearing the new numbers were prepared well in advance of the transfer by telephonists not required at the switchboard during the mid-day meal period. The whole of the pegging and checking of the multiples, &c., was completed by 5 p.m. Telephonists to the number of 75 and a number of Supervising Officers, who ungrudgingly gave up their relaxation on that date, dealt with the work in a very satisfactory manner. A short halt was called in the operations at 3 p.m., when light refreshments were partaken of by the staff, who were joined by the District Manager and the Traffic Superintendent. The former complimented the girls on the excellent work performed by them and said how much he appreciated their kindly thought at having so readily given up all relaxation on that day, one of the few warm days so far when the sun shone forth from a cloudless sky.

Additional Traffic Post.—To meet the continued heavy pressure occasioned by the introduction of the automatic system, an additional Traffic Superintendent has been authorised. The position has been filled by Mr. Martin, from Edinburgh. We extend a hearty welcome and trust that, although coming from the "Athens" of the North, he may find that Manchester is not so black as it is painted.

Toll Exchange.—Owing to the growing importance of this exchange authority has been given for the appointment of both an Exchange Superintendent and a Supervisor. Mr. Green has taken up the former position.

Long Distance Trunk Exchange.—Arrangements are being made for a complete long distance trunk exchange on the American principle to be installed in Telephone House, on the fourth floor. It is hoped the exchange will be in operation towards the end of the next year.

Cupid Amongst the Traffic Belles.—Cupid has now started to deplete the ranks of the Telephone Bell(e)s in the Traffic Branch, and Miss Warren, Clerical Officer, of stop-watch fame, has been one of his victims. She has been the recipient of many useful and beautiful presents.

There are rumours that several other girls are to follow Miss Warren's example in the near future.

PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

BY J. J. T.

(Continued from page 122.)

THAT we in the British Isles do not take kindly to the broadcasting of advertisements, however snugly hidden in concert, solos—instrumental or otherwise—has received quite recent confirmation in a report of the Comptroller and Auditor-General of the Irish Free State. This officer, in his statement for the year 1929-30, shows that receipts from wireless licences amounted to £13,050 for that period. Certain receipts for the use of the broadcasting station for the diffusion of concerts run by advertisers only reached the meagre sum of £30 for the entire 12 months!

The Right to the Ether!—The United States Supreme Court has declined to pass on the validity of the law under which the Federal Radio Commission operates. The controversy reached the court in question submitted by the Circuit Court of Appeals, and involved whether radio broadcasting stations had a property right to the air. Justice Roberts said that the court refused to answer any questions regarding the validity of the Radio Act because they were not presented in proper form. The Commission required Clinton R. White to reduce the power of station WCRM at Chicago and refused to renew the licences of stations WMBB and WOK, the former at Chicago and the latter at Homewood, near the latter city. The owners of these stations themselves then challenged the validity of the Radio Act and claimed "property rights" to the air, which they said could be taken from them only by compensation. The Federal District Court at Chicago sustained the Commission, but the Circuit Court of Appeals asked instructions from the Supreme Court. The Government then insisted that no one could obtain a property right to the ether, asserting that its use constituted "inter-state commerce," over which Congress had exclusive control. That this throws a most interesting light upon the broadcasting situation in the U.S.A., readers will generally agree, not to say arevelation of the extent to which unchecked claims for monopolies are prone to go.

From the most recent information this judgment would appear to be final, for in a list from America just to hand the two last stations above mentioned do not appear in the following recommendations, while WCRM is apparently included in the "twelve other applicants licensed for 25 kw." It will be recalled that a month or two ago a number of stations made applications for permission to operate on the maximum of 50 kw., to which the reply is now given as follows: "Recommendations have now been made to the Federal Radio Commission in respect to those stations which made applications for permission to operate on the maximum power of 50 kw., and the Commission suggested the following eight stations to which maximum power could be assigned: WJZ, New York, now using 30 kw.; WCAU, Philadelphia, now 10 kw.; WSM, Nashville, Tenn, 5 kw.; WSB, Atlanta, Georgia, 5 kw.; WCCO, Minneapolis, 7.5 kw.; WGN, Chicago, 25 kw.; KPO, San Francisco, 4 kw.; and KOA, Denver, Colorado, 12.5 kw.

The selections, according to *World-Radio*, were made according to the five zones into which the U.S.A. is divided as the F.R.C.'s order requires that not more than four of the eight cleared channels assigned to each zone should be permitted to accommodate stations using the maximum power.

The decision is looked upon as a really honest attempt to lessen the "chaos in the ether" which, according to some authorities, was approaching an *impasse* stage.

Wireless Exchanges.—This form of broadcasting has been steadily increasing since five years ago the first one in this country was inaugurated at Hythe, near Southampton. As an indication of the extent to which the system is extending it is safe to assert

that more than 30,000 subscribers are now actually using the system. There is, of course, a public which is quite unmoved by the technicalities of radio diffusion and as a contemporary has briefly and bluntly put it, "is not interested in jumping about from one station to another." Such persons are and would be quite content to obtain a good average selection of the B.B.C. programmes plus the news and the time-signal each night. "Wireless exchanges," "exchange relays," "community reception," "radio re-diffusion," call it what you will, is already firmly established in a number of towns in the United Kingdom. The re-broadcasting is made from a wireless receiving station which selects items from the various broadcasting stations. The distribution of original items is specifically forbidden. Each subscriber pays a small subscription per week, and has to supply himself with the usual annual wireless licence. He has only to provide a loudspeaker and a plug adaptor as apparatus, but naturally agrees to accept the programme selected by the local re-broadcaster. Where necessary the wires are carried across streets and roadways at a height of not less than 30 ft. from house-top to house-top.

In one case, that of Southampton, the minimum payment was, it is understood, fixed at £500. In the case of the Chelmsford Corporation, the monetary conditions were of a similar order, while an indemnity agreement, covered by insurance, is to be made covering every possible contingency. The Accrington Town Council inserted a way-leave rental of 7s. 6d. per annum, although one councillor suggested that as the system would only be used by the poorer section, this charge should not be added! It is not, however, the writer's opinion that radio exchanges are likely to be used exclusively by the poorer section of any community, and apparently the Council as a whole took the same view, for the wayleave formed part of the contract.

The largest development, up to the present, is probably that of the Broadcast Relay Service, Ltd., of Hull, which has no less than 5,000 subscribers, and where the local telephone service is operated by the Hull Municipal Telephone Committee under Post Office licence. The Hull Committee, according to *The Electrical Review*, apparently contemplated at one time commencing a broadcasting relay service of its own and has negotiated with the private company mentioned above. The company, it is understood, is not particularly desirous of parting with its existing organisation outright, and has offered to bring its scale of subscriptions into line with that of the telephone service. The price of the whole as a going concern, plant, &c., is very little below £40,000, so it is said. Alternatively the company is prepared to pay the Corporation 10%, or counter-offer, on gross receipts of all service rentals, in consideration of the right to operate for a minimum period of 10 years, with full permission and facilities for wiring the Corporation housing estates and the use of private telephone wires for sub-amplifying stations on terms "not exceeding those made with the Postmaster-General for similar licences."

Apart from any questions which may arise from these cases, they are very sound proof that "wireless exchanges" have come to stay in this country. The development at present is, however, a small matter when compared with the total number of licensed wireless listeners which has reached the enormous total of 3,780,000.

(To be continued.)

FOR OUR ADVERTISERS.

ALL enquiries should be addressed to the Department of Overseas Trade, 35, Old Queen Street, London, S.W., except where otherwise stated, quoting reference number in all cases. Supplies, &c., required by:—

New Zealand.—Wellington, Post and Telegraph Department, Aug. 19. Private automatic branch exchange equipment (A.X. 10967). Public Works Department, Aug. 25. Supply of storage battery, capacity of 150 A at one hour rate (A.X. 10964). Government Railways, Aug. 27. Underground telephone cable equipment between Wellington and Paekakariki (A.X. 10967). Post and Telegraph Department, Aug. 28. 500 microtelephone handles (A.X. 10980). *Egypt.*—Ministry of Communications, Ports and Lighthouses, Alexandria, Sept. 3. Supply during 1931-31 metal filament lamps (Ref. 27022/31).

"MENTAL WIRELESS."

WE have received the following letter which suggests developments of wireless telegraphy into the realms of mental telegraphy. We cannot visualise the line of future developments; but the idea of reading one another's thoughts seems very far-fetched; and the prospects of one's mental pictures being projected against one's will on a screen as evidence, must seem horrible to contemplate, even to those who favour fourth degree methods:—

"With the coming of the 'robot' voice, and the 'voice' ray recently tried out at Dover, it would seem to me that we have entered on an entirely new field of communication, namely, 'mental telepathy,' or if you prefer it, 'mental wireless.'"

Probably the greatest motive energy in the world, so far as wireless communication is concerned, is stored in the human brain. By means of mental telepathy the brain gives our limbs the power to move freely, and more interesting still, it gives our lungs the power to amplify and broadcast the thoughts that originate in our brains.

Every living thing great and small that breathes must throw a 'mental' and 'body' wave.

These two waves combined, as they are when we expel our breath, form a definite note.

If it were possible by means of the 'robot' voice and 'voice ray' principle to amplify our 'body wave' to a certain strength, it would be possible by this means to hear a man's unspoken thought. Every thought originates in the brain and the brain gives the lung the power to amplify that thought, so that it leaves our mouth as a spoken word.

When that thought originates in the brain it must obviously produce a mental sound of pure distinctness. You can sit down and imagine you are passing the time of the day with a friend, your imagination creates the necessary words in the brain, thereby striking a series of mental notes which by mental telepathy are passed through the amplifiers (lungs) and issue from the mouth in spoken words.

Mental telepathy is carried through the system in the same manner as a voice is transmitted by wireless.

It should not be impossible, therefore, to so amplify the 'body wave' as to detect the different body notes of which that wave is composed.

Imagine you are listening to a bugle sounding the *réveillé*. The notes in your brain are perfectly clear and distinct, and those notes must be carried through the system and will mingle, faintly, it is true, but quite definitely, with the other body notes.

Having amplified the body wave so as to detect the various notes, it would be quite possible to again amplify the bugle notes as to make them audible to other people! In other words it should soon be possible to read another person's thought. By this principle the dumb could speak, and the deaf could hear.

By the same system, it would be quite possible to turn a picture which may form in the 'minds' eye' into a material picture or a 'movie screen!' Picture in your 'mind's eye' a ship sailing on the sea, the picture is perfectly clear and distinct and must strike in the brain another mental note which is carried through the body and so to the 'lungs' by 'mental telepathy.'

Thus a murderer placed in a darkened room, I should say a suspected murderer, would sooner or later turn his thoughts to the scene of the crime, those thoughts could be amplified and reflected on to a screen, and the mental vision he forms of the actual murder would likewise appear on the screen, thereby establishing his guilt!

Although I know nothing of the material workings of wireless, &c., I am convinced that 'mental telepathy' is directly associated with wireless and will some day be perfected, in which case it will be possible for two friends to converse directly with each other over thousands of miles by the system of 'mental wireless.' May I ask the favour that you place this suggestion before that countryman of mine (I'm English) who discovered the 'robot' voice, and also to those who succeeded in turning the human voice into a ray of light, and ask them to give me the benefit of their opinions on this subject."

RETIRED C.T.O. OFFICERS' OBITUARIES.

No one who saw Miss Jessie E. Cameron at the Kew Garden gathering in the early part of June could in any way have anticipated her demise on the 17th of the same month, after only a few days' illness. Miss Cameron was a favourite both in and out of the office, which she entered in 1884, becoming a First Class Supervisor in 1913, and retiring at the age limit in October, 1928.

On the following day, June 18, at Catford, Mr. J. J. Moul, a former well-known A/Supt., also passed away. Mr. Moul commenced his service in the C.T.O. in 1870, but took duty at Plymouth, and it may be recalled by some of our readers, returned to T.S. in 1873, and with Messrs. James Bailey, Percy Evetts, Jack Hobday and A. H. Spratley, the two latter some time since deceased, became crack stick puncher for Wheatstone, a term now practically obsolete, by the way. Mr. Moul also "went to Fleet Street" for a time, was made Senior Telegraphist in 1889, A/S I 1897, A/S I 1906, and retired in 1913.

The passing of Miss M. A. Cooper at Palmers Green on July 2 removes another link with the old school. She joined the old Electric and International Telegraph Co. in March, 1864, transferred to Post Office 1870, made Supervisor 1883, and was the last "Matron" to be appointed, succeeding the late Miss M. H. Greer in 1901, and was made "Lady Superintendent" in 1903, retiring in 1906. "A most charming lady, and one of the worthiest of the many worthies of the old regime," remarks an equally worthy correspondent.

J. J. T.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(Continued from page 236.)

- 1919, May 7 ... Postmaster-General (Albert H. Illingworth) appointed a Departmental Committee to consider what alterations were expedient in existing telephone tariffs.
London—Brussels communication restored.
- 1919, May 15... London—Hague telegraphic communication opened.
Office copies of delivered telegrams abolished in the Central Telegraph Office, London.
Telegraph Money Order system extended to Malta, Greece, and Alsace Lorraine.
Mullard produced valves for wireless working which could be used for detecting, amplifying, or oscillating.
- 1919, June ... Post Office purchased large number of motor vehicles for conveying mails.
Merchant Shipping (Wireless Telegraphy) Act made it compulsory for all British sea-going ships over 1,600 tons to carry wireless apparatus.
United States and British Admiralties experimented with radio-controlled ships as targets.
Speech and music transmitted wirelessly from Arlington, U.S.A., to Paris.
Satisfactory wireless communication established between Dutch East Indies and Holland—about 12,000 km.
- 1919, Aug. 5 ... Chelmsford wireless station was able to communicate with Madrid.
Large wireless station erected at Bordeaux.
- 1919, Aug. 23 London—Berlin and London—Hamburg telegraph communication restored.
- 1919, Sept. 3... London—Zurich telegraph line restored.
- 1919, Sept. 15 Liverpool—Havre telegraph line restored.
- 1919, Oct. 17 London—Berne telegraph communication opened.
Chinese Board of War inaugurated a Wireless Telephone Signal Corps.
- 1919, Oct. 26 Anglo-Belgium telephone service re-opened.
- 1919, Oct. 27 Anglo-French telephone service re-opened.
- 1919, Nov. 4 ... London—Geneva telegraph line opened.
- 1919, Nov. 24 British Imperial Wireless Telegraphy Committee appointed "to prepare a complete scheme of Imperial wireless communications in the light of modern wireless science and Imperial needs." (Chairman, Sir Henry Norman.)
Creed Electric Perforator and Printer patented.
- 1919, Dec. 19 Franco-German telegraph communication re-opened.
- 1919, Dec. 31 897,173 telephones in use in Great Britain and Northern Ireland.
- 1920, Jan. 14... Wireless apparatus obligatory on Greek merchant ships of 1,600 tons gross upwards, and having on board 50 or more persons.
- 1920, Feb. 17 Conference of Telegraph Supervising Officers held at General Post Office, London.
- 1920, Mar. 31 Post Office deficit during previous 12 months £1,128,065.
Wireless telephonic conversation exchanged between London and Rome.
- 1920, April ... Vlug system of wireless, with underground aeriels, tried between Schwenningen and Bandoeng, Dutch East Indies.
Charge for London—Paris telephone calls raised to 6s. for 3 minutes and zone charges increased.
- 1920, May 8 ... London—Bale telegraph line opened.
- 1920, June 1 ... Letter postage rate increased to two pence for one ounce.
- 1920, June 30 Post Office Committee reported on telephone charges and recommended the adoption of the message rate system. The report was referred to a Select Committee of the House of Commons.

(To be continued.)

THE Telegraph and Telephone Journal.

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SEPTEMBER, 1931.

No. 198.

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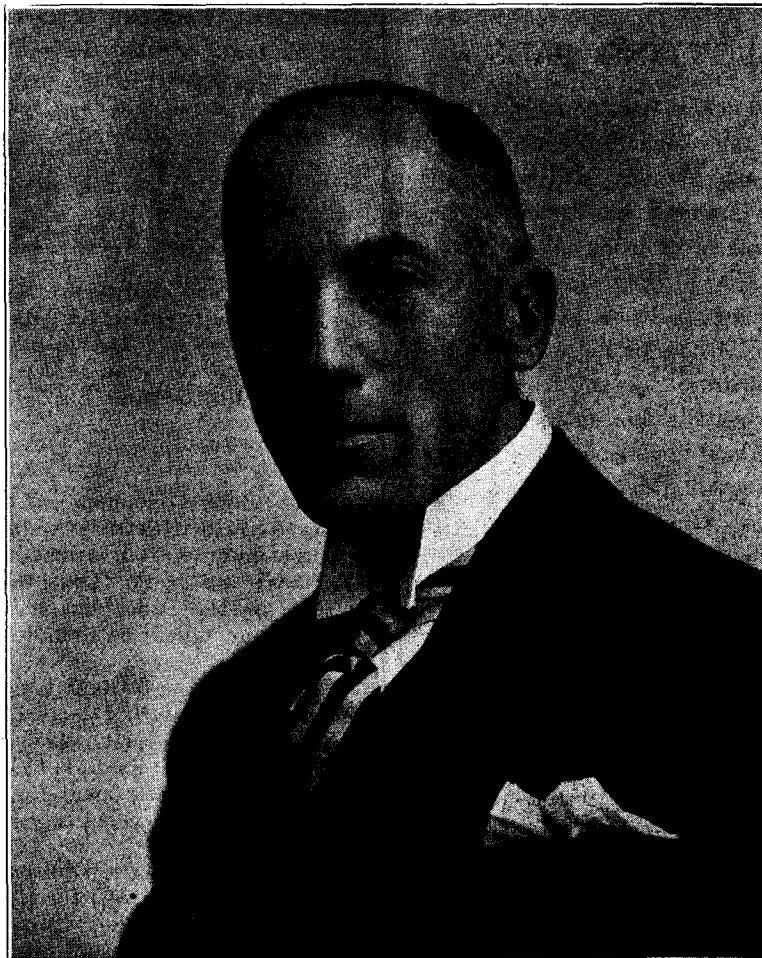
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

XC.

MR. R. TINNISWOOD, O.B.E.

MR. TINNISWOOD's departure from the Ministry of Pensions, in October, 1929, to take up his appointment as Assistant Controller of the London Telephone Service, in charge of the Accounts and Contracts Branches, was in the nature of a return home because the first eighteen years of his official career were spent in the Accountant-General's Department of the Post Office, which he entered as a Second Division Clerk in November, 1898.

His period of exile can be attributed to the work which he did as Secretary of an Interdepartmental Committee appointed in 1913 "to consider proposals for facilitating the payment through the post of benefits under the National Insurance Act." This Committee invented Postal Drafts, of which Army and Navy Allowance Forms were the offspring; and with the enormous development of



[Photograph by L. McLennan, North Finchley.

allowances and pensions during the war, Mr. Tinniswood was commandeered by the War Office, where his energy and ability had become known, to take a main part in administering the system of payment. Then the Ministry of Pensions was created and he was transferred there.

Now that pension work is stereotyped, and, moreover, is falling in volume, Mr. Tinniswood has been re-transferred to the Post Office and is again in a department where there are the movement and growth which his energetic and zealous temperament loves.

During his strenuous past years Mr. Tinniswood has remained a church organist, but it is not known whether this vocation has appealed to him as a sedative or as an additional activity. The same doubt applies to his recent removal to one of the more remote and rural places from which people travel daily to the City. Anyway, it is understood that he is happy for the present in breaking in a large garden.

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - -	{	Lieut.-Col. A. A. JAYNE.
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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVII.

SEPTEMBER, 1931.

No. 198.

GRAFFITI—AND BLOTTING PADS.

ACCORDING to the *Star*, a psychologist has been giving advice to people who are nervous of using the telephone. Americans may stare and wonder, but such people actually still exist. Our psychologist does not seem to have enquired into the cause of this nervousness. Does it result from a fear of being unable to make oneself heard, or of being unable to hear? Does the victim hesitate to incur a stigma of ineptness or inexperience, or is he merely rattled at the thought of wasting his own or his correspondent's money on an imperfectly achieved venture? Is this fear a remnant of the earlier days of telephony when the transmission of speech was less reliable, and some patience and experience were necessary to carry to a successful issue a transaction over the wires? It is hard to say. The psychologist's remedy, according to our information, simply amounts to this "that by doing two things at once, by scribbling noughts and crosses, drawing caricatures, or composing patterns on the writing-pad before him, the nervous telephone user will forget all about telephoning and speak naturally as if the person were standing before him." The *Star* goes on to say—but does not disclose precisely its authority—that "the Post Office people, too, prescribe similar diversions for nervous telephone users. They say it makes for better telephoning."

We must confess we had not associated this scribbling on writing pads with nervous telephoners in particular. The habit is widespread; indeed, it could almost be contended that the average telephone user, while waiting for his call or listening to his correspondent,

adorns his pad, or any piece of paper handy, with diagrams, figures, cross-hatchings and arabesques of all sorts. Some merely write their own names, or any word that is uppermost in their minds, with curious and deliberate flourishes. But the practice is of venerable antiquity, and the graffiti scratched on the walls of Pompeii and other ancient and ruined cities have been sedulously collected by the learned. The pedantic may argue that scribbblings are not graffiti, but whether written in pencil or scratched more durably on a hard surface, these attempts at expression by the incomplete artist and unpractised author are all akin. Some convey information or abuse, such as the prognostic of the gentleman who loves to reiterate "Lambskin for the Lincolnshire," or the opinion of the small schoolgirl who chalks on a gate "Mary Watkins is a fool." Some carve hearts and cupid's arrows, or less decorous designs on trees and walls; some, their own initials—comparable with the man who writes his name repeatedly on a blotting pad when telephoning. The inscription "Bill Stumps his mark," which so sorely puzzled the Pickwickians, is a genuine example of a graffiti, but so also, we think, is the less permanent effort of the patient listener with the receiver pressed hard to his ear. Some draw meaningless and elaborate designs, others a figure of some artistic pretensions; others, again, scribble a remembered phrase. Their works still await the care of the curious collector, the compiler of the bulky and annotated volume; but when the archaeologist is once astride his hobby horse there is no stopping him, and the insignificance of his material will be no deterrent. Whether he will use his labours to prove how the man of the telephone age overcame nervousness, or to demonstrate what ideas filled his mind or what designs amused his leisure, the future may perhaps disclose.

HIC ET UBIQUE.

THE revised charges for calls in the Anglo-Latvian telephone service were introduced on Aug. 1 last. The charges from London to the two zones of Latvia are now 17s. 6d. and 18s. for calls of three minutes' duration between 8 a.m. and 7 p.m., with reduced charges of 10s. 6d. and 10s. 9d. for calls made after 7 p.m.

In booking a telephone call to any of the overseas radiotelephone services a subscriber may in future ask for the call to be limited to three minutes, four minutes, five minutes, or a longer time if he wishes; and the Post Office undertakes to terminate the connexion as soon as the caller has had the specified period of effective conversation, unless he definitely asks for an extension.

Users of these long-distance radiotelephone services may sometimes feel, during conversation, a doubt as to the precise number of minutes for which they will be required to pay the fee—which, in most cases, is at the rate of £2 a minute. It is hoped that this new arrangement for booking calls for a limited period will be useful in meeting any such difficulty.

If the caller does not fully use the time for which he has asked (for example, if he asks for a six-minute call but terminates the call at four minutes) he will be charged only for the time actually used, subject to the usual minimum of three minutes.

A writer in the *Daily Mirror*, after doubting the story of the schoolboy who, having been asked the date of the Battle of Hastings, replied "One-oh-double-six," goes on to say:—

"But I do know that I understood a bright young thing at a party to tell me that a friend had had Fife cocktails. While I was wondering what kind of a concoction a Fife was it dawned on me that what the girl meant was 'five'—only pronounced in the telephonic way."

This is by way of demonstrating what the telephone is, doing to our language. But what are the slight peccadilloes of telephonese to the crimes against colloquial English born of the cinema?

Telephone service has no successful competitor because it is the only service which is always worth more than it costs, says an American authority, Mr. M. T. Caster.

A Northamptonshire paper, containing some reminiscences of the first exchange in Kettering, quotes the following statement:—

Telephoning was much cheaper in those days. Northamptonshire subscribers paid £10 a year, and could speak to any subscriber in the county, and as many times a day as they desired, without further payment. With the coming of nationalisation a cheap telephone service vanished, never to return.

Speaking to "any subscriber in the county" sounds so much and, alas, means so little. The £10 subscriber could, in fact, speak as often as he liked to a handful of other subscribers in Kettering, Wellingborough, Northampton, and Rushden—about 200 in all, and most of them in Northampton—but not to Peterborough, then the only other exchange in the county. To-day there are upwards of 1,100 telephones in Kettering, in place of the 20 or so existing in the golden era referred to, and about 50 exchanges in the county instead of 5.

According to *The Electrical Review*, a direct telephone service between Brisbane and Perth, a distance of 3,400 miles, has been officially inaugurated. The connexion is made through the main trunk-line exchanges of Brisbane, Sydney, Melbourne, Adelaide, and Perth. Between Brisbane and Melbourne, 1,300 miles, carrier-wave equipment is employed, and from Melbourne to Perth, 2,100 miles, an ordinary metallic circuit is used.

Amongst the trials of the Wayleave Section, at Headquarters are problems like the following:—

"I am asking you if you would be so Obligeing to tell me about the Telephaff pole in the garden my Father name is . . . 2, Brunswick Street. . . . I am the daughter of . . . I should like to know about the Pole my Father is dead and cant get eny account of it I should be very thankfull if you write back and let me know something about it. Mrs. . . ."

Then they have to bear with fortitude scathing criticism, from Belfast, of the action of a "vandal Post Office" in "setting up more depressing poles in an avenue rich in arboreal effects."

The Telephone Service is in the field, says the *Sunday Dispatch*, and with mellifluous words which would have staggered and shocked the dry-as-dust Civil Servant of a generation ago, they are inferring that the roses round the door will smell more sweetly if there is a telephone on the bureau:

"Artistic, comfortable, sunny. Garden with roses, trees and green lawns. . . . Books, easy chairs, pictures, musical instruments, wireless. . . . But there is one thing which MUST be added—an invaluable adjunct to all these things—namely, telephone service."

It is almost irresistible. The newly formed publicity department of the London Telephone Service has made a good start.

REVIEWS.

"*The Romance of Electricity.*" By Wilfred H. Randell. (Published by Sampson Low, Marston & Co. xviii + 238 pp. Price 10s. 6d. net.)

In the present year, in which is being celebrated the centenary of the discovery by Faraday of electromagnetic induction, the foundation upon which the whole of electrical engineering has been built, widespread interest has been aroused in electrical matters. The present book has been written to meet this interest by providing a clear and readable account of the whole field of electrical engineering. Every phase of the subject is covered. The stories of the great pioneers, the development of telegraphy, telephony, and wireless, power stations, lighting, traction, medical electricity, electricity in the home, electrical time service and miscellaneous applications of electricity are all described in a light and breezy, but at the same time accurate, manner. The information given has been brought right up to date, and is illustrated by a large number of excellent and well-reproduced photographs. It is a book which will be welcomed by all wishing to get some idea of what modern electrical engineering really means, while the professional electrical engineer will also derive pleasure from the accounts of the early days of the industry, and, since no one can have a close acquaintance with all its ramifications, from the descriptions of those aspects of the profession which are outside his own personal experience.

"*Faraday.*" By E. W. Ashcroft. (Published by the British Electrical and Allied Manufacturers Association. 134 pp. Price 7s. 6d. net.)

In September this year will be celebrated the centenary of the discovery by Faraday of Electromagnetic Induction—the fundamental discovery on which the whole of the present-day applications of electricity is based. The interest aroused by these celebrations has focussed attention on the man himself and stimulated a desire to know more about the story of his life. Unfortunately the early biographies of Faraday are now out of print and difficult to obtain, and in these circumstances the appearance of the small book under review will be welcome. The book is delightfully written and well printed, with a reproduction of the picture of Faraday in the National Portrait Gallery as frontispiece. It should find a place on the bookshelves of all interested in the development of electrical engineering.

MANCHESTER CHAMBER OF COMMERCE HANDBOOK.

WE have received from the Manchester Chamber of Commerce a copy of their Handbook for 1931-32, a well-illustrated, bound volume of some 250 pages. It is described by their President, Mr. T. D. Barlow, as a serious endeavour to present a true picture of the varied activities of its members. This purpose it well fulfils. It tells of the Manchester of yesterday and to-day, and has an article on the outlook for the future. Cotton, banking, engineering, chemicals and foodstuffs are dealt with in a series of articles. There are informative indexes and tables of statistics, including a useful table of overseas telephone charges from Manchester. The volume is a venture designed to assist traders who desire to open or extend their relations with the Chamber and one which might be profitably imitated by other large Chambers of Commerce.

SOME ASPECTS OF TELEPHONE EXCHANGE STAFFING.

By P. J. SPENCE.

AMONG the many important items which combine to make the service given by any particular telephone exchange efficient one of the most important is, without doubt, the provision and arrangement of the staff. Our engineers and other experts are constantly introducing improvements in equipment and apparatus, operating procedure, and guiding instructions regarding the manifold services which are now offered to subscribers, but the beneficial effect of these on the service is considerably minimised if the staffing arrangements at an exchange are not kept under constant review and adjusted to meet the needs of the traffic as often as may be necessary and practicable.

The effect which a bad telephone service has on a subscriber differs from that of other services, inasmuch as when he is kept waiting for a call he cannot see the other fellow waiting also, as would be the case at busy times at a store, or railway station booking office. This produces the impression on each subscriber that he is the only sufferer, and dissatisfaction results. It is essential, therefore, that the staff provided should be such that prompt attention can be given at all times, and also that the service given should be consistent and even.

Apart, therefore, from the well-known axioms of courtesy, accuracy, and speed, none of which is likely to be maintained with bad staffing, the objectives to be borne in mind in connexion with staffing arrangements are the necessity for (a) giving a prompt, consistent and even service, (b) avoiding strain on the staff through overloading, (c) economy in staffing without adversely affecting items (a) and (b). The first two of these items are, to a certain extent, interdependent, because overloading causes a strain on the staff, which if continued for any length of time must be reflected in the tone and attitude adopted towards subscribers. Calls get answered out of turn, the speed of answer and speed of disconnection become uneven and, generally, calls cannot receive the attention needed to give subscribers a satisfactory service. On the other hand, much overstaffing may also prove detrimental to the service. With a reasonably full load the staff get into a stride and there is a certain amount of rhythm about the work which is lacking with under-loading. There is then a tendency for the time taken to answer calling signals to increase, and the prompt supervision of calls tends to slacken, owing to the inertia of idle moments having to be overcome. Defects such as these cause irritation to subscribers, who in their turn are apt to throw the blame on to the operators, and a bad feeling is thereby engendered.

In consequence of the incidence of telephone traffic, with its fluctuations, not only from day to day but at different times of the day, it is, of course, not practicable to keep the staff exactly adjusted to the traffic requirements at all times. For obvious reasons, also, it is not possible to review and revise the staffing requirements at too frequent periods. It is necessary, therefore, to decide (1) the most suitable stage at which additional staff should be provided, and (2) the period for which additional staff, when provided, should suffice, having regard to the objectives previously mentioned.

The ideal method of adjusting the staff to the traffic needs, so far as the service aspect is concerned, would be to provide additional staff as soon as the traffic appears to be exceeding the standard load for the existing staff at any particular period of the day, however short. This arrangement would not, however, be practicable, as the training which it is necessary for an operator to undergo before being allowed to deal with public traffic takes one or more months, according to the adaptability of the learner, and it would not be possible to estimate so far ahead, with any

degree of accuracy, the stage at which an additional staff half-hour would be required. It would therefore be necessary to keep a reserve of operators always in waiting—an impracticable, or at any rate an uneconomical, proposition. On the other hand, to wait until the full services of an operator were required before providing additional staff, would entail overloads being carried for an appreciable period, which would be unfair to the staff and detrimental to the service. The arrangement which best meets all needs, therefore, is the happy medium.

The standard operating loads, and the equating values of the different types of calls, have been designed with the view of providing for the normal fluctuations of traffic to be handled without strain. It is not unreasonable therefore to wait until traffic grows to such an extent that the load in a few hours a day frequently exceeds the standard. The actual stage at which an additional operator should be provided varies according to the type of position concerned, e.g., on A and jack-ended B positions additional staff is necessary when the total load exceeds the standard for the number of staff employed, by half an operator's load. It is possible, from the known representative traffic characteristics of an exchange and the growth in lines, to estimate with reasonable accuracy when such a state of affairs is likely to exist, and to arrange for the recruitment and training of learners accordingly. As regards the reverse order of things, except in the case of a large reduction of the number of subscribers through an area correction transfer, or a severe slump in the calling rate, both of which are exceptional occurrences, the necessity for a decrease in staff at any period can usually be met by the non-filling of vacancies or by arranging the number of staff on leave to suit the occasion, the latter, of course, only being possible when the drop in traffic is a normal yearly occurrence.

The provision of staff for future growth is necessary, mainly, in order to avoid having to carry out revisions of staff at too frequent periods. Growth is automatically provided for, to a certain extent, by the fact that the provision of additional staff before the period when it is fully required, results in a certain amount of redundancy. It is the practice to provide sufficient staff to meet the estimated traffic needs three months after the introduction of revised duties. With the smaller exchanges, and in areas having low calling rates, the addition of one operator will often meet the requirements for a longer period, but wastage is avoided to a certain extent by the employment of part-time operators; in a number of cases, however, the choice must lie between under- and over-staffing, and the latter, as being the lesser of two evils, is adopted. The redundant time can, of course, be utilised on certain non-manipulative duties, but it is not possible to cover all these duties by the redundancy, because the latter is a constantly decreasing factor.

The arrangements indicated in the foregoing paragraphs render it possible to maintain a reasonably close adjustment of staff to traffic, having regard to the service and economic aspects already mentioned. In order, however, that the staff provided can be used to the best advantage there are other factors which need consideration and close watching. The periodical staff adjustment for each half-hourly load, should of course, be carried out for all types of positions, combining or jointly staffing these when the traffic on any particular type is low enough to render such combination economical without acting adversely on the service. This is dependent on many factors, e.g., the number of positions to be covered, the distances between the different suites, &c. The even loading of positions is also a very important consideration. Uneven loading on A positions could be partially met by team work, i.e., assistance received from operators on adjacent positions, but such assistance ought only to be relied upon for the purpose of smoothing out inequalities due to the incidence of the traffic and the varying efficiency of operators. With positions unevenly loaded there would be a tendency to allocate the more efficient operators to the more heavily loaded positions and such a practice would seriously restrict the flexibility of the staffing. The maximum flexibility with a given number of operators can only be obtained when the normal position loads

are such that any member of the staff can be allocated to any position, and this is only possible when the positions are fairly evenly loaded. It is necessary, therefore, that the loads on the individual positions be reviewed from time to time, with the object of redistributing the lines should it be found that uneven loading exists. With the same object in view care should be taken as to the positions to which new subscribers should be connected.

Another factor which has a most important bearing on both the service and the economic aspects is the co-ordination of working positions, i.e., positions equipped with working lines, to the number of positions staffed. When the number of working positions is greater than the number of operators provided—the latter, of course, being decided on a traffic basis—the unstaffed positions are worked by operators on adjacent positions. Calls dealt with on the “dropped” or unstaffed positions slow down the work of the operators, whose output is therefore affected. The output of an operator is further reduced as the number of positions to be covered increases. During the slacker periods, of course, “dropped” positions are inevitable, but except in exceptional circumstances, such as the anticipation of a rise in the calling rate in the very near future, or where there are equipment limitations, the number of working positions should not be allowed to exceed, for any length of time, the number of positions warranted by the load in the busy hour. “Dropped” positions produce the same effect as uneven loading, previously referred to, and are likely to prove wasteful so far as staffing is concerned. Incidentally, it might be mentioned that the cost of “loading up” is small compared to the cost of an operator and involves a comparatively simple engineering operation.

The foregoing remarks apply, in the main, to day staffing. As regards night staffing, a review of the requirements at reasonably frequent periods is, of course, just as important as with day staffing, in order that trained staff may be available when required. It is usually possible, however, to keep a closer adjustment of staff to traffic requirements at night by the employment of part-time operators to cover the busier evening and morning periods, the part-time attendances being extended as required.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at June 30, 1931, was 2,004,048, representing a net increase of 9,201 on the total at the end of the previous month.

The growth for the month of June is summarised below:—

Telephone Stations—				London.	Provinces.
Total at June 30, 1931	...	...	...	720,425	1,283,623
Net increase	...	...	...	3,424	5,777
Residence Rate Subscribers—					
Total	...	...	...	184,574	287,009
Net increase	...	...	...	1,091	1,643
Call Office Stations (including Kiosks)—					
Total	...	...	...	7,159	28,332
Net increase	...	...	...	96	144
Kiosks—					
Total	...	...	...	2,456	8,504
Net increase	...	...	...	58	153
Rural Railway Stations connected with Exchange System—					
Total	...	...	...	17	1,988
Net increase	...	...	...	—	3

The total number of trunk calls in April, 1931 (the latest statistics available) was 10,116,266, representing an increase of 209,506, or 2.1% on the total for the corresponding month of last year. Outgoing international calls in April numbered 45,155, and incoming international calls 48,673, as compared with 45,543 and 48,689 respectively in April, 1930.

Further progress was made during the month of July with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Sanderstead.

PROVINCES—Evington (Leicester), Hampton (Southampton), Stoneygate (Leicester), Streetly (Walsall), (all automatic); Aycliffe (Darlington), Barkstone Ash (Tadcaster), Beeford (Driffeld), Belford (Northumberland), Chipping (Preston), Childrey (Wantage), Calbourne (Southampton), Essendon (Hatfield), Fressingfield (Harleston), Garlieston (Newton-Stewart), Hawkley (Petersfield), Hascombe (Godalming), Hoghton (Blackburn), Martinstown (Dorchester), Manea (March), Mereside (Peterborough), Oxenwood (Newbury), Oakley (Guildford), Pleasley (Mansfield), Penybont (Llandrindod Wells), Pipers Pool (Launceston), Rickling (Saffron Walden), Rufforth (York), Stow (Lincoln), Saxthorpe (Holt), Sherburn (Malton), Schivas (Aberdeen), Winkleigh (Okehampton), Wickenby (Market Rasen), Wylve (Salisbury), Wheaton Aston (Stafford), (all rural automatic);

and among the more important exchanges extended were:—

PROVINCES—Armley (automatic); Barnstaple, Elgin, Fleet, Inverness, Leigh, Lincoln (all manual);

71 new overhead trunk circuits were completed, and 75 additional circuits were provided by means of spare wires in underground cables.

SELLING THE TELEPHONE.

BY F. J. LANE.

A CORRESPONDENT, in your columns not long since, complained that instead of behaving normally and booming our wares in the approved (and successful) Oxford Street manner, we contented ourselves with the futile procedure of pestering shy citizens with canvassers—a proceeding which he declared, rather nastily, did little more than increase the sale of enamelled plates bearing such offensive legends as “No Hawkers” and “No Canvassers.”

The Editor is to be thanked for waiving the journalistic law relating to anonymous letters, for such thoughts should not be suppressed, and, indeed, it is a fact that many members of the service interested in its continued success have some sympathy with the nameless critic.

No one with ordinary powers of observation can doubt the power of advertising as a selling device, and the indignation of the correspondent and his silent friends is to some extent understandable.

Products are sold in enormous quantities, with corresponding profit to their vendors, solely through the agency of advertising and associated suggestion. The word “solely” is used advisedly, for it would not be difficult to name twenty good selling products in as many seconds which have no merit whatsoever—many are quite useless, still more are the poorest value for money, and some are definitely harmful.

Moving to a slightly higher plane, the writer has in mind two commercial articles of widely different character for which enormous sales were built up by the same “magic” means combined with real merit. The respective manufacturers then decided the battle was won and stopped advertising. The rapid result of this was that the sales dwindled almost to vanishing point—this, in spite of the fact that the name of the products had achieved the distinction of being almost a household word. In both cases publicity was restarted with gratifying results.

It would be possible to go on giving examples of the power of, even the necessity for, advertising to convince the most hardened sceptic—if, indeed, there is any.

Considered in relation to publicly-owned telephones, however, the matter has a modified aspect. The price of any article of ordinary commerce may be roughly regarded as the price the public for which it is intended will pay. Advertising naturally increases the cost, but this is offset by the power of the advertisement to convince the buyer that the enhanced cost is still low enough—though, of course, he doesn't see it quite like that. Publicity is essential because the buyer (in this imperfect world) would not otherwise agree that the article were worth anything in particular, even supposing he ever heard of it.

If a Government Department descended entirely to the practices outlined above, it would certainly be told about it. It is surely clear that the time has arrived when the matter of telephone publicity and sales should be closely studied and reviewed, having, of course, due regard to the question of cost.

It cannot be suggested, of course, that the selling side of the service has been completely ignored. In the past few years the Contract Branch has grown enormously, but the fact remains that the Department has hesitated at this advertising business. The progress of the selling side of the Telephone Service has been characterised by a curious nervousness. It is an annoying fact that the Contract Department itself has only just outgrown the position of being the "poor relation" of the Service—a position for which there never existed any reason.

At present the canvassing Contract Officer (in the case of private residences, at any rate) is not infrequently greeted with considerable surprise. People have not thought of a telephone in the sense which is likely to assist them: they've seen them, of course, and very likely frequently used them, but the idea of having such an expensive (so they're taught) installation to themselves is nearly so remote as the idea of possessing a steam yacht! It is obvious, under these circumstances, that the officer's task in inculcating the new idea and teaching his prospective subscriber that he or she can "afford it" is not too easy.

The fact remains that a large section of the public view the service with scarcely veiled hostility, and a still larger section are more or less indifferent to it and untouched by it. Thousands, also, believe that the supply of telephones does not demand a rental. They believe—quite erroneously—that telephones are supplied on a "pay for your calls" basis in other countries.

It is no use blinking the fact of the existence of *hostility and indifference*, and saying there is no substantial reason for such views of a service which is reasonably cheap and efficient. It does not matter, in the purely commercial sense, if the service is efficient: what matters is to convince the public that it is.

This is not a sacrilegious exhortation to foist any kind of service on a credulous public by any immoral means that can be found. The duty and desire of a State Department is to produce an efficient service, but it is obvious that all its efforts in that direction are set at naught if the public believe, however unreasonably, that the Department have either failed to do this or do not trouble about it. It is necessary to note, also, that the commercial aspect of the telephone service has already been officially admitted, as is evidenced (to mention but one thing) by the increase in the contract staff and the thought (even pressure) applied to it. There is no drawing back from this course, nor any reason for not pursuing it successfully.

When one turns to examine what schemes we can adopt to advertise the service, one is first struck by the fortunate position the Post Office holds in the matter of facilities for free, or very cheap, publicity. By the expenditure of some paint, paper, and printers' ink, it is quite easy to make reasonably sure that the people who do not see a telephone advertisement at least once a day, are either blind or bedridden.

Motor vehicles (painted at present, it is melancholy to note, in as neutral a shade as possible) connected with the service are visible to the *trained* eye everywhere. Kiosks are even more ubiquitous and there are acres (possibly square miles) of Post Office walls at present, to some extent, covered with advertisements. In addition, stamps have to be cancelled by some means—why not by telephone information? Lastly, the postal service is available at cost—actually at less than normal cost with careful arrangement.

These small ventures which have been and are being made have, however, served two useful purposes; firstly, they have proved that telephone sales can be so accelerated (particularly is this clearly shown in the case of literature relating to extensions enclosed with quarterly accounts); and secondly, they destroy the argument of those who would declare that such actions are unbecoming and unworthy of a Government Department.

A large scheme of advertising which fulfilled the necessary conditions would have to take a definite prominent place in the Department's activities. The literature distributed by any means should be varied and should not be necessarily harping on the domestic uses of the telephone. There is a branch of advertising which takes the form of interesting the public in the fascinating mysteries of the production of an article or the working of a system. The psychology of such methods rests on a sound basis—a fairly obvious one, as a matter of fact. Here is an excellent opportunity for telephones, for nothing—not even broadcasting—can be made as interesting as a word-picture of the intricacies of a modern national and international telephone system.

It must by now have occurred to the reader (as, indeed, it has to the writer) that none of the suggestions above is of such startling and novel nature that one can be sure that it hasn't been thought of before. No doubt that is quite true, but the writer thinks it probable that they have not received the attention they deserve because of a belief that, supported by active contract work of the kind at present in progress, the telephone is self-advertising and self-selling. The extent to which this is true is not satisfying enough, and the present sales system is inadequate, because all efforts at making a highly efficient service are offset by the fact that our customers, actual and potential, either do not or will not believe in its efficiency. The contract system, as it is pursued at present, can never surmount this difficulty. It is believed that support by means of well-conducted and extensive advertising is essential, but it must be admitted, nevertheless, that much can and should be done within the service itself.

This is an age of specialisation: administrations of every kind are divided into water-tight compartments. This is good so far, but water-tight compartments which have no doors will make a ship unworkable.

The delegation of limited authority from a central office to small sections is, unless the dangers are fully recognised, the great stumbling block to smooth working under centralisation. The harmonious working of the various departments is liable to be neglected, and the central executive is too far away to ensure it at all times. The salesman whose business it is to offer the service as a whole to the public feels the full force of this because he has to accept a sort of responsibility for all the groups at his back, and is more or less disowned by them all. Criticism of the weakness of British salesmanship made recently by prominent people, including the Prince of Wales, are nearly all attributable to this cause.

What is required is a system which gives a general direction to all departments towards selling—all sections and their actions must point that way. Any action, formality, or administrative device made for office convenience which checks the general movement towards selling should be discarded. Perfection of system in the "audit sense" is no sure way to success: psychology should have equal place with formal economy in the system. The basic principle should be "Sell the telephone"; and everything else (even the calling rate) will look after itself. Before condemning

the apparent sacrilege, consider what it means. It means that each section shall relate its working to the ultimate common object of satisfying the customers of the service, who are at the same time the owners of it, so that they will feel the presence of a human reasonableness, thus cutting through their newspaper-fostered illusions that they are being mangled by some ponderous machine. Nothing very terrible about that. "Sell the telephone" is a simple expression and guide, much more understandable than a grandiose flow of words calculated to mean the same thing, but more likely to mean nothing at all to most people.

Nothing has been said, so far, regarding the value of any change in tariff rates. The reason is that such a dimension has little place here. The salesman's business is to sell the articles he has, not make fresh ones; or to put it another way, the safe-maker's business is to make his safe burglar-proof by his own skill, and not to rely on the electric alarm signal maker. Rates are fixed by economic necessity, though, of course, the method of charging may be varied to suit different conditions met with. The subject is a very interesting one, but, as has been said, hardly to the point here.

Returning to the actual selling agencies to be employed, it is doubtful if the present arrangement and disposal of contract officers would dovetail well with an extensively conducted advertising scheme. The general work done by an officer would increase and active canvassing would be lessened thereby, whereas what would be required would be wide, steady canvassing to follow up and *keep in step* with publicity. No amount of narrowing each individual officer's field, necessitating a great increase in staff, would meet the case; the exigencies of a contract officer's duty would not permit it, and the increase in cost would be against such a course.

What is required is a more or less mobile force in each district, uninterrupted in their work in driving home the "lesson" by personal touch. The number to cover a "large area" would be quite small, provided they had nothing to deflect them from canvassing duties. The idea would be that such officers would secure agreements where possible and where unsuccessful leave the usual tariff cards (bearing an identification number) and literature. Any cards which come in should be dealt with by the contract officer for the district, who would, of course, endeavour to secure the maximum result therefrom. The canvassing officer might keep in touch with the contract officer in the area and supply him with information as to those to whom a "call back" would be likely to secure business. The main thing is that canvassing should be interrupted and made ragged by the officer darting here and there for interviews and call-backs. In this way an enormous field would be very rapidly and effectively covered.

Commission on orders obtained by such efforts, whether the orders were obtained in the first instance or by the contract officer subsequently, should be paid to the canvassing officer, and such payments to contract officers might well be dropped.

This is not intended to imply that the contract officer of the district would cease to obtain orders himself—the personal touch which a contract officer maintains with those in his area (particularly large business houses) is a decided asset and should no more be neglected than it is now. In a sense the contract officer would go on as now, but the additional canvassing staff would link him more thoroughly with the publicity system.

The new junior grade proposed would provide a useful avenue to promotion to young members of the Post Office service, and such a force would provide the best possible source of recruitment of contract officers which may be required from time to time. Their age would naturally be considerably less than that of the average for a contract officer, and their remuneration correspondingly lower.

These suggestions may at first sound a little sensational, but surely the smallest study will show that if special efforts are to be

made to increase the telephone by extensive publicity, it is not very irrational to adapt the contract staff to the new conditions in such a way as to secure the maximum result.

In conclusion, a word as to the probable effect of a well conducted publicity campaign.

There is apparently an idea that the effect would be comparable to that produced by the announcements and intensive advertising which heralded the opening of a new store in Oxford Street many years ago. The writer is not so sanguine as that. The opening of a new shop is accompanied by a tremendous suggestive force to draw the public to the store—a familiar enough thing in name but presumably more attractive and offering better value than the other. It works because general goods are in continuous demand and there are enough people to go round all the shops, though, no doubt, such a campaign is fearfully costly. Telephone advertising is more of an educative nature, and judging from results which are being produced in other industries which have some points of similarity to telephone service, the effect would be the lifting of the curve of telephone statistics to a higher level very quickly, and the gradual steepening of its slope—the rate of growth would accelerate to a greater extent than it does at present. There would not be a sudden sharp boom—which is perhaps just as well, seeing the unfortunate knock booms have of having their converse close on their heels.

A statistician would, no doubt, prove that such a process could not go on for ever. His dictum would not sound unfamiliar, but we can leave the exact determination of saturation point to the discussions of the years to come.

LIVERPOOL NOTES.

We are pleased to announce two more promotions in the Liverpool Traffic Staff. Mr. H. J. B. Woodward has been promoted to be Traffic Superintendent, Class II, at St. Albans, and Mr. Moseley to a similar post at Birmingham.

Mr. Woodward has been attached to the Liverpool Traffic Staff almost since its inception as a separate department under the National Telephone Company. He commenced as an exchange clerk under Mr. David, who was Exchange Manager at the Liverpool Royal Exchange. Later he transferred to the Traffic Office and became an Assistant Traffic Superintendent. By his agreeable personal qualities he has made himself popular with all his colleagues and business associates, and has always particularly identified himself with the social activities of the staff in their times of relaxation.

Mr. Moseley was one of the original Traffic clerks of the National Telephone Company in Liverpool. In 1921 he was appointed to an Assistant Traffic Superintendent post at Leeds, where he remained about seven years, and then, like many others, he decided to return to his old home town. Mr. Moseley's amiable qualities will be missed. His readiness to give assistance at all times to others has earned for him the golden opinions of his colleagues.

To both these gentlemen we tender good wishes and hopes that they will in due time earn further promotion. Each will take with him some tangible expression of the affection and esteem of their many friends.

Miss A. E. Bawden, typist, Douglas, I.O.M., has been promoted to Clerical Officer in Liverpool. We wish her the best of luck.

Mr. A. Davies, a young member of the Liverpool Traffic Department, and of the Post Office Golfing Society, has had the distinction to win the Peel Town Cup (value forty guineas) in the Open Golf Competition held there recently. The cup is held by the winner for one year. The competition was over 18 holes, Medal play, and Mr. Davies returned a net score of 68, the best in a field of 40 entrants. The bogey of the course is 74.

Miss K. Emmett, one of our shorthand typists, has left us and gone to the Taxes. A camera, subscribed to by her many friends in the Telephones, accompanies her on her short journey along the corridor. Taxes and 'Phones are next-door neighbours.

On her retirement, after more than 40 years' loyal service in the Telephones, under the National Telephone Company and the Post Office, Miss Ruth Sears entertained a number of her colleagues to a tea party. Afterwards she was presented with a number of presents. The esteem and affection in which she was held by supervisors, operators and probationers may be judged by the fact that in all there were 21 presents, including a gold signet ring, fireside chair and slipper box, two tea services, handbag, umbrella, and many other useful and beautiful presents.

TELEGRAPHIC MEMORABILIA.

A MOST graceful tribute to *Dirigeurs* was recorded in the July issue of *Le Relais*. The occasion was an improvement in the local synchronism of the Baudot multiplex, suggested by an old and experienced dirigeur attached to the Paris C.T.O. The nature of the suggestion does not matter for my special purpose, except to confirm the high quality and logic of the suggestion of Monsieur David, its inceptor. The editor of *Le Relais*, himself a skilled technician, is apparently doubtful, in these times of financial stringency, whether the Administration will be able to make a practical trial, but his comments on the value of the trained *dirigeur* in general, and of Monsieur David in particular, are thus expressed in print:—"It is not known what fate is reserved for this improvement. It is, however, useful to place the fact on record, if only to demonstrate how the daily observation of faults inherent to all mechanical movements is a real factor in their progress and in their perfection. Also, we must agree how conscientiously the important duties of the *dirigeurs* are performed, and how solicitous they are for constant care of the delicate organisms of which they have charge.

Companies.—*Western Union Telegraph Co.*—Gross revenues for six months ended June 30, 1931, \$57,749,031, against \$68,886,812, for corresponding period 1930, net income, \$4,345,211, against \$4,930,320.

Marconi Wireless Telegraph Co. Ltd.—Report for year ended Dec. 30 last, states profits of Imperial and International Communications for 1930 amounted to £326,248. To profit has been added £200,000 transferred from general reserve, making £526,248 available, out of which a dividend of £525,000 (1.75%) being paid by the Communications Co. Proportion received by Marconi Co. amounts to £77,206 and after crediting this amount, accounts of latter company show a net profit of £212,336, as compared with £796,235 for two years 1928-1929. Dividend of 10% on ordinary shares (against 15%) authorised, leaving £31,788 carried forward (against £38,966).

Imperial & International Communications Ltd.—As a result of discussions with the Advisory Committee (Mr. Wilfrid Greene (Chairman), Lord Ashfield, and Mr. Lawrence Durning Holt), the court of directors has come to the conclusion that nothing short of "drastic measures," can permanently restore health to the Communications system. . . . Reference has been made through the same channel "to the serious position created by the increasing competition through the opening by governments of direct wireless services.

Eastern Telegraph Co., Ltd.—Directors recommend dividend of 7% on ordinary stock against 7½. The carry forward was £595. West India & Panama Telegraph Co.'s report for 1930 shows revenue £44,603, against £59,950 for 1929. Debit at profit and loss account carried forward is increased by £27,805 to £207,939.

Personal.—Captain J. Muir Donaldson, M.C., M.Inst.C.E., M.I.E.E., Chief Engineer N. Metropolitan E.P.S. Co., has been elected President of the Institution of Electrical Engineers for 1931-32. The result of the ballot to fill vacancies occurring on the Council of the I.E.E. on the 30th inst., is as follows:—President, Capt. J. M. Donaldson, M.C.; Vice-Presidents: Mr. J. M. Kennedy and Mr. F. W. Purse; Hon. Treasurer: Mr. E. Leete; Ordinary Council Members: Lt.-Col. A. G. Lee, O.B.E., Mr. C. Le Maistre, C.B.E., Mr. H. A. Ratcliffe, and Mr. E. H. Rayner, Sc.D.

Congratulations to "Yorkie" on his Kiplingesque "Adventure in the Desert" which appeared in the last issue of *The Overseas Telegraph*. "The 2,000-tonner coaster, *Missir*, which carried a mixed cargo of men, camels, horned sheep, and machine guns across to the Cyrenaica coast, stretching away in the far distance, an arid tawny brown. . . . Dawn and a sea of purple. . . . Night again and the stars"!

A Book Worth Reading.—Librarians of both telegraph and telephone interests should endeavour to read "The Romance of Electricity," by Wilfrid L. Randell; Sampson Low. Naturally, it deals with all the various uses to which electricity has been harnessed. One old announcement published about 1838-40 I do not remember having before seen in its completeness regarding "The Electric Telegraph," and is as follows: "This interesting and extraordinary apparatus, by which upwards of 50 signals can be transmitted 280,000 miles in one minute, may be seen in operation daily (Sundays excepted) from 9 a.m. till 8 p.m., at the telegraph office, Paddington, and Telegraph Cottage, Slough. Admission one shilling!" Apparently at this period the telegraph was looked upon as something special in the way of a Fun of the Fair item!

Countries.—*ABYSSINIA.*—Ras Tafari, the Emperor of Abyssinia, recently laid a corner stone of the new radio station which the Government is erecting at Addis Abeba. *BELGIUM.*—It is generally understood throughout Europe that the Telegraph and Telephone Administration of Belgium proposes to issue a loan to enable it to meet its obligations without having to abandon entirely its programme of improvement and extension. The amount is not yet known.

CANADA.—*State Control of Broadcasting?*—The Premier of Quebec is to contest the recent judgment of the Supreme Court of Canada, that the control of broadcasting is vested in the Federal Parliament and not in the provincial Legislatures. He announces that he will appeal, says Reuter's Quebec agency, to the Judicial Committee of the Privy Council. Until the appeal is decided, no action can be taken by the Federal government with regard to the nationalisation of the service on the English method, as recommended by the Federal Commission last year. *COLOMBIA.*—*Reuter's Trade Service* at Bogota states that the Federal Government has signed a contract with All-American Cables, Inc., for the erection of a wireless and radio-telephone station at Medellin. In view of the monopolistic character of the concession, proceeds the Bogota message to state, the owners of the electric plant at Zipaquirá, a suburb of Bogota, have found it advantageous to dispose of their holdings to North American purchasers (the Electric Bond & Share Co.) who have taken over all concessionary rights at a fair price.

CHINA.—Chinese railway stations, as is well-known, are the well recognised meeting places of the population, quite apart from whether one is about to travel or to arrive! Of this propensity, says *World Radio*, advantage is to be taken, and these public forums are to be used as the rallying points for a huge loudspeaker campaign.

FRANCE.—General Ferrie recently read two communications to the Academy of Sciences, the first, says *The Electrical Review*, from the inventors of a triode valve, capable of being dismantled and of dealing with a power of 150 kw. The filament consists of eight separate wires parallel to each other. The second communication, reports *World Radio*, was from M. Belin, in which he described a method of transmitting photographs in such a manner, that no one but the possessor of a receiving machine specially adapted for the purpose could receive them. At fixed intervals signals of a deliberately confusing character are transmitted, which destroys the picture, except when received on a machine which has been previously synchronised with the transmitter.

World-Radio anticipates that the new station of Radio-Paris, at Ersarts-le-Roi, will be opened next month, and that it will be in full operation for the winter season. The station will have an aerial power of 85 kw. From the same source it is gathered that the French authorities are now making wider use than hitherto of telephone cables which have been specially designed for frequencies used in radio broadcasting. Cables have been laid between Bordeaux and Paris, and Paris and Marseilles. Cables are also to be ready for use between Bordeaux and Toulouse, and

plans are readily available for the laying of similar cables between Paris and London and Paris and Brussels. The installation of the Paris—London cable will provide an additional link for the relay of Continental programmes to this country. With one's day-to-day observations on radio communication developments, the more and more does one reach the conviction that more wire appears to be used in the organisation of wire-less, than ever was!

Another Job for the Postman!—The proposed French taxes on wireless, I am informed, will be in the form of a separate tax each on receivers and valves. Some opposition is expected on the latter, but the ingenious device of collecting the tax on receivers by monthly instalments, is to be inaugurated so as to ease the pain. Neither will it be necessary to go to a post office to pay the tax. The postman is to collect the necessary amount and will hand in an official receipt in exchange!

GERMANY.—Telegrams, in plain language only, may now be sent by passengers travelling on the Berlin—Vienna airways while in flight to various places in Germany, Austria, and Czechoslovakia. The number of words is limited to fifteen. A new broadcasting station, says *The Electrical Review*, with a power of from 75 to 150 kw. is to be opened at Goldachhof, near Munich, at the beginning of next year.

GREAT BRITAIN.—It is understood, as we go to press, that the B.B.C. is still looking out for a man who can beat the tom-tom for an hour at a time. As it is also understood that this particular artist is not required until October, there would be plenty of time to gain the services of half-a-dozen natives from the East, who are not infrequently employed to perform unintermittently on this Eastern instrument, hour after hour, the whole night through, during the week-long festivities of a Hindoo wedding! [Seven such nights are a personal recollection spent in an Allahabad bungalow in 1906.] *Reconstruction of Daventry Radio*.—A paragraph has been going the rounds of certain daily and weekly papers regarding the presumed imminent reconstruction of this long-wave station, which in general terms is to the effect that if the necessary permission can be obtained from the Post Office, the B.B.C. hope shortly to make Daventry the most powerful broadcasting station in the country. Consent to the proposition would entail erection of a 100 kw. transmitter and the cost is variously estimated at £150,000 to £200,000. Our respected contemporaries may be premature: in view of economy schemes that may be authorised, one may say very seriously "Wait and see."

Television has also been well to the fore in the public eye, due, it would appear, to the fact that a director of Baird Television Ltd., London, recently sailed in the *Bremen* for New York, while Mr. J. L. Baird, the inventor himself, is to follow to put certain work in hand. We are assured by the *Daily Telegraph* that an all-British staff is to be one of the features resulting from the negotiations which "have been concluded, whereby the mass-production of Baird televisors is to be started almost immediately in the United States." Mr. G. A. Atkinson, the film critic of the *Daily Telegraph*, commenting on this particular step taken by Baird Television Ltd., and financed by American banking interests according to this same reliable daily, Mr. Atkinson, let me repeat, viewing these developments with some alarm, makes the following definite statement regarding television: "The direct television of films is now well within reach of scientific achievement, though the direct television of complete stage plays is probably more distant."

The interest taken by the Films in Television is made clearer by Mr. Atkinson's next question, to which he leaves those concerned to answer. He asks: "Of what use are our 5,000 theatres (in this country) if one film can be televised to 5,000,000 homes?" We leave the matter there so far as the film interests are concerned.

HOLLAND.—A picture telegraph service was recently inaugurated between Amsterdam and Bandoeng, Dutch East Indies, says *The Electrical Review*. The new Atlanta Hotel at

Rotterdam has been wired and equipped to provide a complete radio and musical service. A central control room serves the various restaurants and dance floors; each guest room has a loud-speaker and switch for alternative programmes, gramophone music, or the hotel's own orchestra. In case readers should think we are behind the Continent in these matters, it may be stated that a miniature installation of this type is actually in use at Queen's Court, London, W. HUNGARY.—The *Electrician* informs us that plans have now been approved for extending the Hungarian broadcasting organisation. A large transmitter, having a power of 50 kw., will be erected at Lakihegy. At the same time relay transmitters are being erected at Nyiregy—Hazal (5 kw.) and at Miskolo, Magyar—Ovar and Pecs, where the relay station will have a power of only $\frac{1}{2}$ to 1 kw.

ITALY.—The Italian Ministry of Communications is to lay a new telegraph and telephone cable from the mainland to Sardinia. Reuter's Trade Service informs us that the same Ministry is installing television apparatus at Rome. The apparatus, it is said, is one of the most perfect of its kind, and it will work in connexion with the chief foreign centres. INDIA.—From an Indian correspondent comes the following statement, which reads: "It is understood, here, that negotiations are nearing completion for the merging of interests in wireless and cable telegraph traffic in India. It is believed that the existing Indian Radio Telegraph Co. will increase its share capital for the purpose of securing control of Indian business, while it is understood that the majority at the Indian end will be Indians." Imperial & International Communications Ltd. will have a substantial holding in the new company. *A New Radio Station*.—Bedi Port, Kathiawar, according to *The Electrical Review*, is to have a new wireless station for communication with ships at sea. The equipment is being manufactured by the Marconi Co. and will operate on the interrupted continuous-wave system with a power of $1\frac{1}{2}$ kw., the receiver covering the exceptionally wide wave-range of 15 to 22,000 metres! *Wireless Licences*.—The special Indian correspondent of *The Electrical Review* thus epitomises the special regulations for licences recently issued by the Director-General of Posts and Telegraphs. Under these regulations, licences for the demonstration of radio receiving apparatus (i.e., by genuine merchants), the installation of such apparatus for approval at the addresses of prospective customers, and the hiring-out of radio sets, will be granted to *bona-fide* dealers, one licence covering the erection and working of one set only. This licence will ordinarily be available for use throughout one province (excepting Indian States and foreign territories). A sufficient number of licences must be taken out to cover the maximum number of sets to be used at one time. The duration is twelve months and the fee is Rs. 10 per licence. Application for such licences must be made direct to the Director-General.

MANCHURIA.—Direct wireless telegraph communication between Mukden and San Francisco has recently been inaugurated by an American company. The new connexion, in conjunction with the present radio service between Mukden and Berlin, now provides Mukden with a round-the-world system of wireless communication, remarks *The Electrical Review*. RUMANIA.—The number of broadcasting listeners has increased very rapidly, says a report from the British commercial representative to the Department of Overseas Trade. At the end of 1929, the report continues, the total was 29,746; six months later the number had grown to 43,254. The increase is attributed almost wholly to the removal of practically all restrictions on the importation and use of radio apparatus. The State takes 30% of the receipts, the balance going to the broadcasting company, which also derives revenue from advertising. SCANDINAVIA.—Until recently, says an electrical publication, Norway, Sweden, Finland, and Denmark, were unable to participate in international programme wireless exchange, as no cable existed to carry the programmes to and fro. This has now been remedied by the laying, recently, of a cable between Zarrenzin and Kampinge, to enable these four countries to take part in European activities. SCOTLAND.—The transatlantic wireless station at Kemback,

Fifeshire, is to be transferred to a site on the estate of Tarvit, Cupar. Contractors, so we are informed by the technical press, will shortly be invited to estimate for the work. The buildings at Kemback were erected five years ago, and the station worked more or less on an experimental basis. The experiment has proved very successful and warrants the erection of permanent buildings.

SWEDEN.—According to the *T. and T. Age*, the wireless telephone is now widely used by the Swedish Merchant Marine. It is installed on many Swedish ships in the Baltic Sea, and wireless stations on the eastern and southern coast are equipped to transmit spoken (as well as signalled) messages. It is also employed by the Swedish pilot service between outlying lighthouses and the mainland, and the Swedish-American line will soon install wireless on its motorships, *Gripsholm* and *Kungsholm*.

U.S.A.—*Television*.—Reuter's Trade Service states that, on the 85th storey of the Empire State Building, 1,000 feet above Fifth Avenue, New York, the National Broadcasting Co. is installing complete television equipment with antennae on top of the building's mooring mast, 1,250 feet above street level. The company's engineers believe that the new equipment will help to overcome many of the difficulties previously encountered in visual broadcasting, and after a year of experiments, develop it sufficiently for public use. Work in the studio will be begun as soon as an experimental licence can be obtained from the Federal Radio Commission.

From the same reliable source, we also learn of a recent trial from the sixth new television station in New York metropolitan area, where a group of entertainers gave a forty-five minute programme before the microphone and the television camera. Guests in the same building saw good recognisable pictures, but from 14 miles away came reports that reception was marred and the images rather faint. The new station (W2XAB) will transmit daily television programmes. It sends on 60 lines, frequency 2,750 kcs. and power 500 watts. Study will be made of the causes and cure of interference which mars the received image, and whether the underground railways, tramcars, electric signs, or lifts effect the clarity of reception.

VENEZUELA.—A wireless telegraph service has recently been established between Berlin and Caracas (Venezuela).

Character.—No character is sound and solid which enlarges its surface at the expense of its supports.—Lytton.

J. J. T.

BIRMINGHAM NOTES.

The District Manager's Office Cricket Club has had a very satisfactory season so far.

The matches which have been played have been the means of providing very enjoyable evenings and have revealed the exceptional talent of Mr. E. T. Vallance, Assistant Traffic Superintendent. The form he has displayed in the club matches led to his selection to the Birmingham Civil Service Area Team in the Curtis Bennett Cup Competition. Playing for the Area Team against the Taxes at Stoke-on-Trent, Mr. Vallance hit up 78 runs, and in the match against Manchester at Birmingham he bowled unchanged, taking three wickets at a small cost.

The Birmingham team has reached the semi-final in the Curtis Bennett Competition.

In the midst of the everyday trials of the telephone official it is refreshing to receive a letter from a subscriber ending as follows:—

"As you get plenty of "Bricks" from your subscribers, I think you might be glad to have a bouquet for a change. During the whole of the ten years I have been at this address I cannot remember a single instance of having cause to complain about the service. On the contrary, I have always found it efficient in the highest degree. If there is no objection, you can convey my thanks to the staff of the local exchange for their unflinching courtesy and helpfulness."

LETTERS FROM A RETIRED CONTRACT MAN TO HIS SON.

(III.)

MY DEAR TOM,—So Whitsuntide has come and gone and you with it. We miss your cheery optimism and wish we could see more of you, but you have your career to make, and mother and I both recognise that fact, and you know that there is nothing we would not do to help you.

Our talks together while you were here confirm my belief that you have your feet on the lower rungs of a ladder to the top of which you can easily climb, if—not a very big "if" in your case—you apply yourself diligently to learning your job, which in telephone matters is a life-long study.

Changes and improvements follow each other in rapid succession. Indeed, I know of no other business of which the same can be said except, perhaps, wireless. The telephone salesman must be constantly moving forward, all the time absorbing new ideas and evolving new arguments, if he is to keep abreast of the technical and other innovations. He who stagnates is lost.

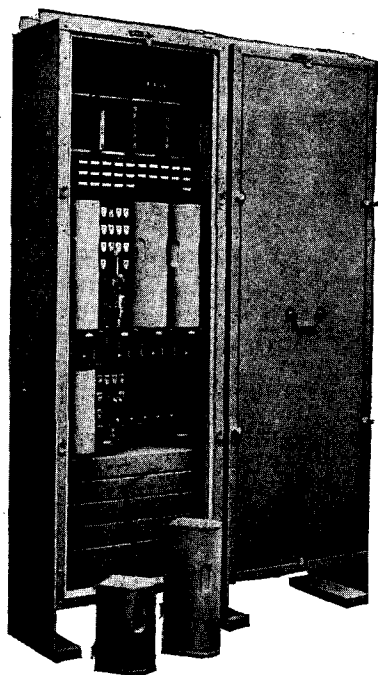
Few of the public realise the uses to which the Telephone Service can be put. How many, I wonder, take the trouble to study the preface to the Telephone Directory? It is a mine of information and you ought to study it well, for it contains much which you will be able to make use of when interviewing the great B.P.

It is not enough that you should get an order, it is even more important that the subscriber should realise the various uses to which the service can be put, in order that he may make use of the facilities at his disposal. The Department wishes to increase the calling rate from each and every installation and to make it of such use to the subscriber that he turns to it naturally as to a friend, to help him over the rough places of life.

Some Contract Officers I have known seem to think that commission is the be-all and end-all of their official career, and that anything to which commission is not attached is a necessary evil to be dealt with in a more or less perfunctory way. That is an utterly wrong way of looking at the matter. Commission, after all, forms but a small proportion of a Contract Officer's remuneration, and, because the ratio of pay to commission is high he must, if he is honest, work just as hard on those points of the service outside the scope of commission as he would if commission were payable on them. Indeed, I would go so far as to say that it should be a point of honour to deal even more meticulously with that type of case. I feel sure, dear lad, that you, at any rate, will never fail in your duty in this direction.

I have been thinking over the point you raised when you were here, about the correct sort of rig-out to wear when on duty, and I have come to this conclusion: If the area allotted to you is in the City, then the clothes to wear are just those adopted by other business men. Something dark and serviceable. Nothing loud or such as will be conspicuous. Just be one of a crowd in this respect and you won't go far wrong. I remember two cases which nearly drove a Contract Manager crazy. One man turned up on one occasion in plus fours, and he hadn't even the excuse that it was Saturday, either; another appeared in white flannel trousers, and the shock is remembered in the office concerned to this day. Both, quite rightly, were sent home. A little more latitude might be allowed in country areas. Some quiet tweeds might be suitable, but nothing which would offend good taste or mark you out as an eccentric in matters sartorial. Buy the best that you can afford; it is the cheapest in the long run, and well cut clothes may get you the entrée when badly fitting or worn garments may result in your being taken for a hawker of boot laces or picture

G.E.C.



Two "UNITS AUTO No. 5" as supplied to the British Post Office for service in the rural districts of Great Britain.

G. E. C. Rural Automatic Exchanges have now placed the smallest village and the most remote community on the map of telephone progress.

Low current consumption and reliable switching apparatus are among the features which enable the R.A.X. to be left unattended and yet to provide a grade of service comparable only with the most advanced city standards.

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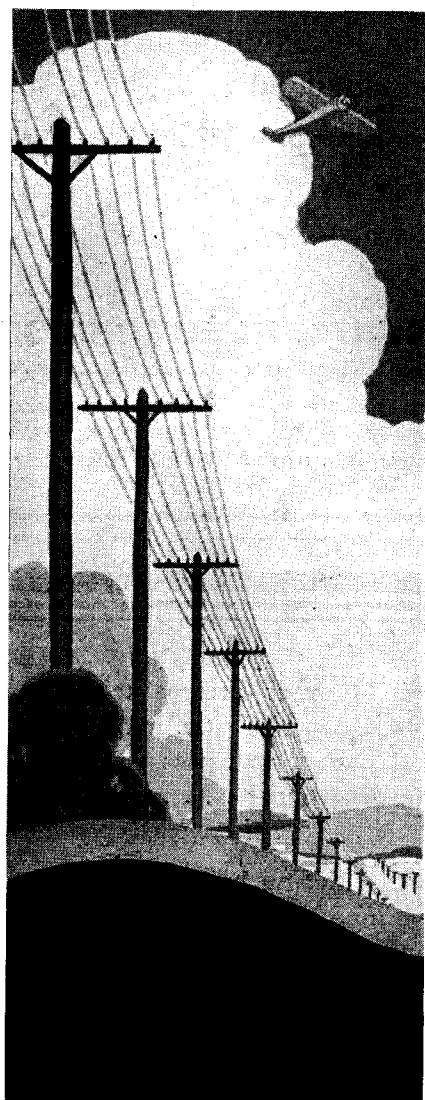
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INTER-COMMUNICATION
TELEPHONES.

THE TOLL CONNECTOR—SYMBOL OF STROWGER DIRECTNESS



STROWGER Dial equipment is noteworthy for its speed and accuracy. These two qualities result directly from the simplicity and directness of its action in all phases of operation.

Toll operation is a case in point. The toll operator always has available for her exclusive use a train of special toll switches—of which the toll connector shown here is the final unit. These are standard Strowger switches, composed of standard Strowger parts. By their means the toll operator has immediate access to any party in the exchange area, and can seize a busy line and hold it until the conversation is completed. Arrangements may also be made, if desired, for the operator to interrupt a conversation should one be in progress. By what is at once the most simple and most direct method, toll service on the receiving end is accomplished in a swift, effective manner with Strowger equipment.

The above example is typical of Strowger design, the fundamental premise of which is that the most simple and direct means is the most efficient one. The result is not only swift and effective service to the telephone user, but economy in the cost of apparatus and of subsequent maintenance as well. In selecting dial equipment the importance of these factors resulting from fundamental design should not be minimised. Designed, manufactured and installed by Automatic Electric Inc., Chicago, U.S.A.

STROWGER AUTOMATIC
DIAL SYSTEMS

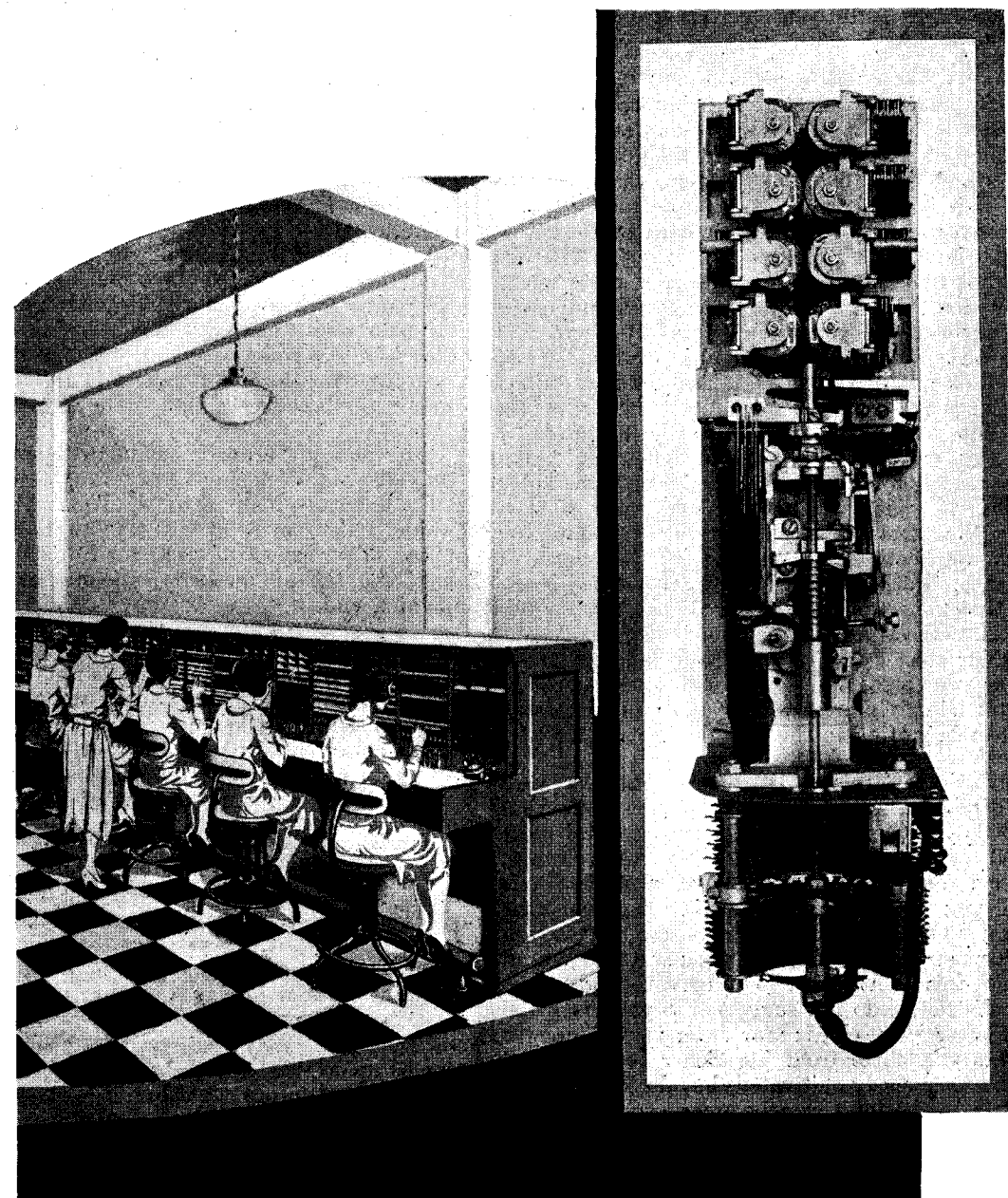
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In Japan • Automatic Telephones Ltd. of Japan, Tokyo
In China • Automatic Telephones of China Federal Inc., U.S.A.
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Automatic Electric Inc.

Manufacturers of
Strowger Automatic Dial Telephone and Signaling Systems
Factory and General Offices: 1033 West Van Buren St., Chicago, U.S.A.

ASSOCIATED COMPANIES

American Electric Company, Inc., Chicago
International Automatic Telephone Co., Ltd., London
Automatic Telephone Manufacturing Co., Ltd., Liverpool
The New Antwerp Telephone and Electrical Works, Antwerp
Eugene F. Phillips Electrical Works Limited, Montreal



postcards, and you may find the door shut in your face, or, more often than not, never opened at all, for the housewife sees more through the curtains of her front room than she is often given credit for.

For a similar reason canvassing from door to door presents a problem. If you are seen going from door to door your difficulty in getting a hearing may be increased. Cases arise where, in order to break new ground, a door-to-door canvass, or its equivalent, is absolutely necessary. Too many calls in one street on any one day are seldom necessary. A few calls to-day and a few to-morrow, and those with good wide gaps between the houses called at, I always found the best way. There are generally plenty of streets to be attended to in close proximity to each other, so no great time is lost by adopting this plan. In the more scattered areas actual door-to-door canvassing is quite satisfactory, and time is saved in this case.

Take the earliest opportunity of studying the area allocated to you. Learn all about it, look at it on a map this way and that, so that you can visualise its length and breadth, the good bits and the bad, the business and the residential quarters, the best way to get about it, and if it is so big as to necessitate taking trains or other means of conveyance, how these run both as to routes and times. Find out who are the principal people in the district, what they do and what their interests are, and how these affect the rest of the population. Look up the house-agents and make friends with them: they can help you a lot. Find out where new building is going on and watch new houses like a hawk. Your house-agent friend will often tell you where to find the new tenant before he is actually in possession. Get the office to write to him for you if he is outside your parish. Examine the unsuccessful interview cards left by your predecessor, and follow up likely prospects and see that his follow-up calls are not missed. Constantly be adding likely names to your card index. Cover your area as quickly as possible. If a Contract Officer is working systematically and well, few, if any, applications should ever get the length of being sent in to the office. In the ideal system you would have such a grip of your area that none would be received, but that, under present conditions, is perhaps expecting too much. Anyhow, keep them down. Your chief can give you many pointers about the best way to cover your area, and you should have no fear of asking him; it is as much in his interest as in yours that unnecessary time should not be lost in getting to the heart of the matter.

Don't fail to investigate "mean" streets; I use the word not in any sense of disparagement, but you will understand what I mean. Often a little business or workshop or a general store may be found tucked away, as often as not behind the frontage, in some court or alley. Sally into all the alleys, therefore; one visit will tell you all you need to know, and an occasional visit thereafter to keep you up to date should be sufficient, unless you find something worth pursuing more closely. You will understand that, while I emphasize this point and urge you not to neglect the poorer parts of your district, I do not suggest that you leave the better parts to look after themselves; far from it, the greater portion of your orders will come from the richer sections, and they must therefore be assiduously cultivated, but do see that you give some of your time to the least comely areas.

Keep your eyes open for suitable positions for kiosks and call offices and report them. Send in a rough sketch of the position, not too rough, of course, as to be understandable, like one I once saw sent in by a Contract Officer whose artistic sense had never developed or had atrophied. A famous church was the centre piece, and whichever way you looked at it, it was more like a sausage gone wrong in the making than anything else. You, I know, can do better than that. Put your best into it without wasting too much time. Show measurements to some fixed points, a door, the kerb, or a tree.

Some Contract Officers fail to appreciate the value of kiosks and call offices as a means of educating the public to make use of

the Telephone Service, and even suggest that such facilities deter people from having the service installed, but I am convinced that this is a shortsighted view. Users of kiosks, &c., only get half a service, and sooner or later the other half will become a necessity, and an order will be obtained.

Take a personal pride and interest in your area, and try to know more about it than your predecessor and get more out of it; thus you will find favour in the eyes of your chief. Report anything which you find wrong with any of the Department's plant, a broken window in a kiosk or the light in when it should have been out, or "verse-verse" as Lamb's uncle—wasn't it?—used to say, a call office sign dirty or awry and so on.

As soon as possible, after taking over, introduce yourself to the various engineering officers responsible for the area. Your chief will put you in the way to effect this. They can be very helpful, and a good feeling should prevail between you. The same should be said regarding the supervisor of the Exchange and Traffic Officers generally.

Be methodical in arranging your day's work, set out your route, so far as may be possible, so that you get to your various appointments by the quickest possible method to give you time to sow some seed by the way. If your man is not available, and you are sure it is safe to leave him for a time, get out and make some canvassing calls in the neighbourhood and then call back. "He who sows sparingly shall reap also sparingly," is as true to-day as it was when it was uttered, but don't just chuck the seed in and hope for the best; take a little time to prepare the soil of your prospect's mind, so that the seed gets a chance to germinate.

One interview properly conducted is worth many a half-hearted "Do you want a telephone?" "No." "Are you sure you don't want a telephone?" "No." "Thank you, good morning" sort of thing. Any canvasser who tries to do business that way would be dear at twopence a week, for he is preventing a better man from doing the job properly. Sooner or later he will reach his appointed end.

Some Contract Officers find it useful to prepare certain of their prospects for a visit, and in some districts a letter has been prepared for this purpose. A certain number are made ready by the Contract Officer, complete with envelope addressed, and these are passed into the office for dispatch. I favour the idea myself, as in difficult cases the way is prepared for an interview which might otherwise be refused. You should enquire of your boss about it.

I was watching the fishermen preparing their nets and other gear the other day, and was struck by the way they knew their job. They know all about their boats and gear and how to mend and prepare them, the proper sort of bait for their line fishing and where to get it, where to go to catch the fish they are after, all about tides and currents and the quickest way of getting where they want without hitting a rock or stranding, all about weather conditions and portents. In other words, as I have said, they know their job. Why? Because their living, even their life itself, depends upon that knowledge. So you must know your job; your living and future depend on it, and you should, and I am sure will, act as if your very life depended upon it. That is the proper way to go about your business.

Well, as usual, news has got crowded out, but your mother has promised to attend to that, and I leave it in her capable hands. I am anxious, at the moment, when you are learning your life's work, to give you all the guidance and help I can, hence this long screed. I must fly, as from the sounds of distress I hear in the garden, Telly is after the birds, and at this time they are anxious about their youngsters, just as mother and I are anxious about you, though with less cause, I know. Write soon. Love from us both.

Your affectionate Father,

THOS. E. L. SERVICE.

QUESTIONS ON TELEGRAPHY, TELEPHONY, ELECTRICITY AND MAGNETISM.

THE solution of Question VII is held over, and will be published in the October number.

WHILST BRITAIN SLEEPS.

INCIDENTS OF THE NIGHT TELEPHONE SERVICE.

It is to be wondered if the public realise to what extent the newspaper world relies upon the night telephone service as a means of communication, especially during the small hours of the morning.

London has been truly called "The Switching Centre of the World," and there is scarcely a spot in Great Britain which it is not possible to reach by 'phone at any time of the night, or a place of any comparative size or importance on the Continent of Europe or the United States of America, not to mention several of the South American republics, with which telephonic communication cannot be set up within a very short period—probably minutes.

Romance and tragedy, despair and news of great joy go flashing from one end of the country to another. The sudden appearance of the little glowing opals of light in the London Trunk Exchange, to be followed almost immediately by similar little glowing opals in exchanges north, south, east, and west, indicates that an event of national or perhaps world importance has taken place, and the newspapers are awakening to a feverish activity.

Their readers want the latest news propped up before them on the breakfast table.

To mention a few such incidents: it was by means of the night telephone service that the newspapers first heard of the ambushing and death of Michael Collins in Ireland.

It was the night telephone lines which fed a hungry Press with details of the landing of Lindberg in Paris, after his record making solo flight from New York.

Again, several of our national dailies spent a whole night from midnight till 8 a.m. booking calls to Belgium, Holland, and Germany, in an endeavour to trace the two American airmen, Chamberlain and Levine. It will be remembered that after flying the Atlantic they lost their way on reaching the mainland of Europe and flew in a circle for several hours. The first reliable report came from Dortmund in Germany.

The first indication in this country of the disaster to the R101 appeared as a little glowing opal in the Trunk Exchange in the small hours of a Sunday morning. It was calling the Air Ministry. The operator in Paris amplified the request with the information that Beauvais was telling him the great British airship had been destroyed. For the next few hours the Paris section was one of feverish activity, the French-speaking operating staff in London giving valuable assistance. Tribute is also due to the night operators in Paris and Beauvais.

To come to more recent times, the latest event of national importance affecting the night service generally was "our" earthquake. The experience is best described as follows:—

The scene is G.P.O. South, close to St. Paul's Cathedral, London. The Trunk Exchange is on the third floor, City Exchange on the

fourth, whilst the fifth and highest floor comprises the Toll and new Trunk Record Rooms.

It is 1.25 a.m. Sunday morning, June 7, in the Trunk Exchange. A little group of night telephonists are sitting at a table sorting out tickets. The exchange is fairly quiet. A moment or two later a sudden trembling is noticed. It increases. A distinct swaying motion is felt, and one man points to the patent fire extinguisher hanging on the wall. It has commenced to swing gently to and fro. The swaying motion increases. What is it? Someone says "An explosion." Another suggests that the foundations are giving way. The building next to ours is being rebuilt and the workmen are now laying the new foundation. Can that have caused it? They do not speak again for a moment or so. They are all ex-service men, and have known occasions like this before, which, perhaps, explains the presence of the irrepressible wag, who always appears to be with us at times like this. He states his opinion that "It's another drop in the bonus."

Truly the old spirit of 1914-18 is not dead yet. The tension is relieved. They laugh. The swaying sensation ceases. A bell rings. It is the Toll Supervisor to say all their arc lamps have been swinging and the building seemed for a moment or so as if about to collapse.

Another bell. "Record Supervisor speaking. All our delay boards have been swinging to and fro—thought the jolly old Record Room was going to slide out into the street—pity if it had 'cause it's a nice new exchange and all the woodwork is so nicely polished."

It is only a couple of minutes before the newspapers begin coming through. The Exchange is soon busy. Hull, Leeds, Newcastle, Lincoln, Manchester, Edinburgh, and Glasgow, they have all felt it.

A batch of calls is booked to the observatories in France. Gradually the activity dies down. The sun comes up striking the dome of St. Paul's. Everything outside is still. It is the birth of another day.

The British public will get its news of the earthquake in the late editions of the Sunday newspapers.

W. J. C.

TELEPHONE DEVELOPMENT OF BRITISH CITIES ACCORDING TO THE CENSUS OF 1931.

By W. H. GUNSTON.

THE census of Great Britain, taken last April, affords a convenient opportunity for gauging the telephonic development of the principal towns and cities of the country in terms of "telephone density" by recent and official figures of population. In view of the unequal rates of increase in different towns, it has not hitherto been possible to employ any averaged estimates of population for such towns, and all calculations of telephone density for the last 9 years have been based on the census of 1921. For the country as a whole the estimate published in the League of Nations yearbook for 1926 (45,500,000) has latterly been employed. According to this, in January, 1930, there were 4.15 telephones

per 100 inhabitants of Great Britain and Northern Ireland. The new census shows :—

Great Britain	44,790,485
Isle of Man	49,338
Jersey	50,455
Guernsey	42,606
Northern Ireland (1926)	1,256,322
	<u>46,189,206</u>

As there are at present about 2,040,000 telephones within this territory, their ratio to 100 inhabitants is 4.39.

It might have been supposed that after 10 years' growth of population, in a decade in which the large towns increased at a markedly higher rate than the rest of the country, an apparent falling-back in the figures of telephone density would be exhibited when comparing the telephone totals of December, 1929 (based on the 1921 census) with those of March, 1931 (based on the 1931 census). In general, however, it will be seen that such is not the case. It is true that in the London Telephone Area, in which the enormous increase in population of 800,000 has taken place, the telephone density falls slightly from 8.9 at the beginning of 1930 to 8.7 in March, 1931. The figure for the Administrative County of London, however, has improved from 10.9 to 11.9. It should be borne in mind that the telephone area of most foreign cities corresponds with the municipal area. The figure for the telephone density of London, therefore, might more properly be put, for purposes of comparison, at 11.9 than at 8.7%. In the chief provincial cities (still bearing in mind that 10 years' growth of population is offset in these comparisons by only 15 months' telephone development) Bournemouth has a ratio of 7.0 as against 8.2, Brighton 6.8 against 6.7, Edinburgh 6.5 against 6.3, Cardiff 6.2 against 6.1, whilst Manchester (5.6), Leicester (5.3), Nottingham (5.0) show little or no change. Glasgow (4.9), Birmingham (4.5), Leeds (4.3), and Bristol (4.5), also maintain the same ratios as in 1930, Liverpool (5.3), slightly improving its figure, and Bradford falling slightly from 5.5 to 5.3.

It was recognised, when the statistics for January, 1931, were drawn up, that owing to large increases of population in many residential districts, some of the figures were flattering to the towns concerned; and it is not surprising that towns like Bournemouth and Oxford (for example), with their 20% increases of population, show seemingly better results (when measured by density) in 1930 than in 1931. Yet both these towns show an increase of well over 10% in telephone development, measured by numbers of telephones, during the 15 months. It will be seen that the Southern residential towns and pleasure resorts maintain their high place in the table. The seaside resorts have, in most cases, improved their figures of telephone density, owing partly to the fact that the census of 1921 was taken during the holiday season, and partly, of course, to a regular increase in the number of telephone stations. Hence, where the figures of population were inflated in 1921, as in Eastbourne, Margate, Hastings, and other places, a decreased population is registered for 1931, and a higher telephone development is shown than in 1930.

The subjoined tables are divided into 2 groups, viz.: (a) all towns with upwards of 10,000 telephones, and (b) all towns with upwards of 2,000 telephones and a ratio of not less than 4 per 100 inhabitants.

The first list contains 17 cities, and the second 39 towns and districts. It will be seen that near or adjoining the London Telephone area, there is a ring of districts with a fairly high development, such as St. Albans (7%), Watford (5.6%), Woking (7.7), Weybridge and Walton (10.8), Guildford (9%), Tunbridge Wells (8.1). To these might be added several places with less than 2,000 telephones, but more than 1,000 such as Gravesend (5.4%), Chelmsford (5.1), and Slough (5.1).

The two lists comprise 56 areas, of which 23 (including Norwich) are in the South of England, 15 are in the North of England, 7 in the West or in Wales, 5 in Scotland, 5 in the Midlands, and 1 in Ulster.

(a) CITIES WITH OVER 10,000 TELEPHONES.

	Population 1931. (Thousands).	No. of Telephones per 100 31/3/31. population
London Administrative County ...	4,396	511,292 11.9
1.—London Telephone Area ...	8,210	712,493 8.7
2.—Bournemouth (including Poole and Christchurch) ...	183.2	12,916 7.0
3.—Brighton (including Hove) ...	202	13,760 6.8
4.—Edinburgh ...	439	28,468 6.5
5.—Cardiff (including Penarth) ...	241	13,367 6.2
6.—Manchester (including Salford, Eccles, and Stretford) ...	1,090.9	61,152 5.6
7.—Bradford (including Shipley) ...	328	17,588 5.3
8.—Leicester (including Wigston) ...	250.5	13,351 5.3
9.—Liverpool (including Bootle, Birkenhead and Wallasey) ...	1,777.7	56,185 5.3
10.—Nottingham (including Arnold and Carlton) ...	305.6	15,314 5.0
11.—Glasgow (including Clydebank, Renfrew and Rutherglen) ...	1,175.5	56,100 4.9
12.—Birmingham (including Smethwick and West Bromwich) ...	1,168	52,502 4.5
13.—Bristol (including Kingswood) ...	410	18,740 4.5
14.—Leeds (including Morley) ...	506	21,571 4.3
15.—Newcastle-on-Tyne (including Gateshead, Gosforth, and Wallsend) ...	468	18,418 3.9
16.—Belfast (1926 census) ...	415	16,060 3.9
17.—Sheffield ...	511.7	18,708 3.6
Hull Corporation Area. Hull (including Beverly, Hedon, Hessle, Cottingham, &c.) ...	350	17,075 5.1

(b) PLACES WITH OVER 2,000 TELEPHONES.

	Population 1931.	No. of Telephones per 100 31/3/31. population
1.—Walton and Weybridge ...	30,000*	3,261 10.8
2.—Bexhill-on-Sea ...	21,229	2,167 10.2
3.—Eastbourne ...	57,435	5,193 9.4
4.—Guildford ...	30,753	2,775 9.0
5.—Tunbridge Wells ...	35,367	2,872 8.1
6.—Harrogate ...	38,785	4,171 7.9
7.—Southport ...	78,297	6,102 7.7
8.—Woking ...	29,927	2,309 7.7
9.—Chester ...	41,438	3,077 7.4
10.—Torquay ...	46,165	3,139 7.2
11.—St. Albans ...	28,625	2,014 7.0
12.—Margate ...	31,312	2,133 6.8
13.—Folkestone (including Hythe, Cheriton and Sandgate) ...	54,565	3,554 6.5
14.—Worthing ...	46,230	2,991 6.3
15.—Cambridge ...	66,803	4,158 6.2
16.—Blackpool (including Lytham) ...	127,393	7,561 6.0
17.—Ayr ...	49,385	2,797 5.7
18.—Cheltenham ...	36,784	2,023 5.6
19.—Watford ...	56,799	3,209 5.6
20.—Oxford ...	80,540	4,547 5.6
21.—Bedford ...	40,573	2,300 5.6
22.—Scarborough ...	41,791	2,337 5.6
23.—Southend-on-Sea ...	120,093	6,534 5.4
24.—Bath ...	68,801	3,650 5.3
25.—Exeter ...	66,039	3,339 5.1
26.—Warwick and Leamington ...	43,120	2,150 5.0
27.—Hastings ...	65,199	3,290 5.0
28.—Huddersfield ...	113,467	5,597 4.9
29.—Dundee ...	175,583	71,518 4.8
30.—Reading ...	97,153	4,657 4.8
31.—Luton ...	68,526	3,237 4.7
32.—Aldershot and Farnboro' ...	50,640	2,361 4.6
33.—Preston ...	118,839	5,273 4.5
34.—Aberdeen ...	167,259	7,524 4.5
35.—Newport (Mon) ...	89,198	3,764 4.2
36.—Stockport ...	125,505	5,309 4.2
37.—Norwich ...	126,207	5,052 4.0
38.—Halifax ...	98,122	3,971 4.0
39.—Northampton ...	92,314	3,758 4.0

* With estimate added for the population of Shepperton.

THE MECHANISATION OF THE TELEGRAPHS.

By J. J. T.

IN the present phase of the world's development, wherever that may eventually lead us, in the maze of changes, social, political, religious, financial, and scientific, it is not a matter of surprise, if here and there one listens to the wail of bewildered men and women as to where this aftermath of the world-war is destined. To specialise: there are many serious qualms in the hearts and minds of telegraph operators as to what will become of the Government Telegraphs and its telegraphists in the coming years of the re-mechanisation of the craft. The term *re-mechanisation* is used advisedly. Telegraphy was dependent on mechanical aids from the hour of its inception and establishment by means of morse printer, A, B, C, single and double needle, &c., to Wheatstone, followed by Baudot, Creed, Murray, and other forms of type-printing telegraph apparatus. The direct typewriter telegraph of to-day's telegraph development is for the moment its crowning glory.

With the potentialities which this system possesses of making it easily possible for any firm or organisation to obtain the necessary facilities for providing and for leasing its own telegraph office at a really moderate charge, there would appear to be a definite step towards real progress and the opening-out of a new channel of telegraph activity.

One can understand the disappointment and can sincerely sympathise with those upon whom the fret and worry of these present times have left their mark. It is also understandable that the post-war depression should weigh most heavily upon those deserving men and women of our Telegraph Service who have studied and laboured, given of their very best for years, only to find that a younger means of communication is overshadowing their own particular fields of activity, temporarily, may be, but to them it appears, finally.

It is not easy for such to view the problem as a whole, but they need to be reminded that if Telegraphy has its rival in Telephony, so, to-day, has gas that of electricity, the railway that of the motor-bus and motor-lorry. Each has to find its place in the economy of things as they are to be. Certainly not to revile one another or to minimise the value of one another's services to the community.

Of course, we cannot all enjoy ourselves as does A. H. Johnson, of the C.T.O., in his cartoons of latter-day telegraph conditions, but it is such earnest happy humorists of his type that help their colleagues through trying times. It was so in the grimmer period of the war, when we were invited to pack up our troubles, &c., &c. It is so in these days of gruelling peace.

Mr. Johnson admirably expressed the common regret of the Old Brigade at the demise, at the age of threescore years, of Morse and Wheatstone, in his "In Memoriam" card (which we reprinted on page 211 in the *Journal*). On the reverse was the legend: "To the Memory of the Morse and Wheatstone telegraph instruments, which were laid to rest in the year 1931, after 60 years trustworthy service in the British Postal Telegraphs:

'Though lost to sight, to memory dear.'

THE POSTMASTERSHIP OF TRING.

MR. F. J. TOMPKINS, supervising sorting clerk and telegraphist at Tring Post Office, has been appointed postmaster of Tring, in succession to Mr. F. J. Hurdle, who retires on Wednesday next, Aug. 12.

The appointment gives considerable satisfaction locally, because Mr. Tompkins is a native of Tring, being the only son of Councillor A. J. Tompkins, of Frogmore Street, and has spent the whole of his postal career at the Tring office.

During the Great War Mr. Tompkins served with the R.E. Signal Service in Mesopotamia, and attained the rank of Quartermaster-Sergeant.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business transacted by the Contract Branch during the month of July resulted in a net gain of 2,273 stations.

An advertising postcard to bring again the hand-microphones to the notice of existing subscribers was despatched with the quarterly accounts sent out in July; orders for over 5,000 instruments have resulted so far.

The resignation of Mr. R. A. Loban, Contract Officer, Class II, of the West District Contract Office, was marked by an interesting ceremony in the nature of a presentation to him by his colleagues of a gold dress watch and fob. The presentation was made by the District Contract Manager, Mr. Livermore, who expressed the good wishes of the staff of the office for Mr. Loban's future success. Mr. Loban, who has taken up an appointment in the commercial world, was a very keen young officer and his departure is a distinct loss to the service.

A largely-attended meeting of the staff of the South-East District Contract Office took place on July 31 to wish good-bye and good luck to Mr. C. J. Potkin, Contract Officer, Class I, on his retirement from the service. Mr. Potkin joined the Post Office as a Canvasser in January, 1902, and was promoted to the position of Contract Officer, Class I, in February, 1926. Mr. Rutter, the District Contract Manager, on behalf of the staff, presented him with a cheque and referred to his kindly and generous nature. Mr. Potkin was for a number of years Secretary of the London Branch of the Contract Officers' Association, and his work in this capacity was recognised at a gathering of Contract Officers on July 16, when a substantial cheque subscribed by his Association colleagues was handed to him by the President of the Association in appreciation of his services and as an expression of goodwill.

L.T.S. Sports Association.

Tennis.—The annual cup competitions are now nearing completion. In the case of the Agnes Cox Cup for ladies' doubles, office accounts section, A.R.1 and Ravensbourne Exchange have reached the final, which will be played at Chiswick, Civil Service Courts, on Saturday afternoon, Sept. 19.

The final of the Pink Cup, ladies' singles, will also be played at Chiswick on that afternoon. The present position is: fifth round, Miss Godfrey, Toll, Miss Head, A.R.1, Miss Bromley, Toll, and Miss Parker, Maryland.

Miss Young, Office Wages Section, and Miss Wilson, A.R.1, are both in semi-final.

The general impression is that the standard of play has reached a much higher level this year, and the finals at Chiswick are likely to prove very keen contests.

Cricket.—An important and decisive match was played at Chiswick on Tuesday, Aug. 11, when the Accounts Branch were met and defeated by the Contract Branch in a departmental match for the L.T.S. Cricket Shield. Batting first, the Accounts Branch compiled 69 runs by steady but slow batting. Pearkes was in good form with the ball and secured 7 wickets for 22 runs. The Contract Branch replied by securing the necessary runs for the loss of 5 wickets. Fitzgerald, Harres and Holdstock batted well to secure for the Contract Branch the possession of the shield. As they have in turn defeated all the competing clubs and have avoided defeat themselves, they are worthy winners of the trophy. Congratulations on a very successful season.

Battersea Exchange to the Fore.

A sporting and amusing event took place on Friday, July 24, when a cricket match was played between the ladies of Battersea Telephone Exchange and a team of Traffic Officers, mostly from the South-West District. The match was the result of a challenge by the men, which, of course the ladies readily accepted, and arrangements were speedily made for practice matches to be held in preparation for this epoch making event. These were held in Battersea Park, and aroused a great deal of local interest, the crowd at times reaching alarming proportions, and our players were subjected to a deal of good-humoured barracking.

The match was played on the Polytechnic Sports Ground, at Chiswick, as suitable accommodation could not be secured on the Civil Service Sports Ground, and as the clerk of the weather apparently felt favourably disposed, we were enabled to spend a most enjoyable evening.

Being successful in winning the toss, I decided that the ladies should bat first, and our opening pair proceeded to the wicket amid the enthusiastic cheers of their many supporters. Runs came at a fair rate against the bowling of Mr. Merrick and Mr. Crossley, but when the opposing captain brought on Mr. McCrimmon to bowl, our luck changed, as this "demon-spin" bowler at once proceeded to play havoc with our "batsmen." As the ladies' captain, I raised an objection to him, but was told "This is not a racecourse, but a cricket match!" and so our innings closed for a total of 33.

The Traffic Officers' team consisted of only 10, as compared with our team of 15, and as an additional handicap they proceeded to bat left-handed, and I am sure that some of their strokes could hardly be classed as stylish. Many catches went up, but many, of course, dropped down, and so the men, with six wickets down, succeeded in passing our total, and they thereupon offered to let us bat again. This offer I treated with scorn, as my side agreed that the men must fight to the end, and accordingly their last wicket fell when the score had reached 56. We ladies then commenced our second innings, which continued until 9 p.m., when bad light stopped play and stumps were drawn.

Thanks are due to both Mr. A. C. Abbott and Mr. E. J. Hickmott, our Traffic Officers at Battersea, for their assistance, advice and encouragement in coaching us in the arts of the great game of cricket. On behalf of the ladies, I must take this opportunity of saying how much we appreciated the kindness and consideration that we received from our opponents, to whom we accord a high standard of sportsmanship.

Our team is to continue its practice, and we live for the time when we can challenge the men and beat them—minus any handicaps. Meanwhile, we shall be pleased to demonstrate our skill to any of our sisters in the L.T.S.

By the "Captain of the Ladies,"

Battersea Telephone Exchange.

"Send Off" to Mr. E. A. Pounds.

On Friday, July 31, a farewell party was given by the staff of the West Central Traffic District, in the Gerrard and Regent dining room, on the occasion of Mr. Pounds' retirement from the London Telephone Service.

A large number of guests assembled to express to Mr. Pounds not only regret at his departure, but also a deep sense of gratitude to him for his unflinching zeal and interest in all that concerned the staff.

Mr. Durrant, in opening the proceedings, made known to Mr. Pounds the deep regard with which he was held by all departments of the Service. To illustrate this, he mentioned that a member of the night staff had bitterly enquired why the night staff had not been asked to contribute to the testimonial, with the result that the application was circulated immediately, and responded to generously, by the night staff.

Mr. Pounds was then presented with an "all mains" wireless installation from the staff of the West Central District.

Miss James, who supported Mr. Durrant with a most interesting speech, dwelt upon the influence of Mr. Pounds' cheery disposition, and likened him to Mr. Pickwick, of immortal fame.

Mr. Smith, the night travelling supervisor, tendered to Mr. and Mrs. Pounds the good wishes of the night staff, and presented a cheque on their behalf.

When Mr. Pounds arose, so vociferous was the cheering that he was unable to speak for some moments; when he did, he was visibly affected. He acknowledged, in his usual modest manner, the various compliments bestowed upon him, and paid a special tribute to Mrs. Pounds, who had helped and encouraged him in his work. He appealed to all Controlling Officers to rely upon the loyalty of the staff entrusted to their care, as it was one of the surest ways of getting the best from them in return.

In conclusion, Mr. Pounds remarked that this was not "good-bye," but "au revoir," as he hoped to be present at our future entertainments.

Hearty cheers were given for Mr. and Mrs. Pounds, and all joined in singing "For he's a jolly good fellow."

A social programme followed until 9.30 p.m., when everyone gathered round Mr. Pounds to sing "Auld Lang Syne." With this sincere and happy "send off" ringing in his ears, he went from us.

Personalia.

Resignations on account of Marriage.

Assistant Supervisor, Class II.

Miss E. G. Watkins, of Mitcham Exchange.

Telephonists.

Miss N. Smith, of New Cross.	Miss R. Record, of Central.
" A. Hill, of New Cross.	" G. B. Tempson, of Central.
" V. E. M. Johnson, of Hounslow.	" D. I. Crabb, of Central.
" O. M. Green, of Sloane.	" V. Furness, of Victoria.

Miss M. A. F. Russell, of Sloane.	Miss G. E. Le Gassicke, of Bishopsgate.
" D. Wade, of Redhill.	" D. G. Wells, of Metropolitan.
" D. A. M. Rowe, of Woolwich.	" I. E. S. Ager, of Barnet.
" D. K. Taylor, of Putney.	" W. A. Neal, of Toll "B."
" E. F. Stanton, of Park.	" H. L. Burchell, of Terminus.
" D. A. Steele, of Park.	" L. Draper, of Enfield.
" C. D. G. Bennett, of Paddington.	" K. C. Foster, of Avenue.
" S. M. A. Little, of Amherst.	" E. C. Stock, of Avenue.
" W. A. Barnard, of Livingstone.	" F. E. Brown, of Kensington.
" C. E. Currie, of Sidecup.	" M. D. Odell, of Ravensbourne.
" V. D. Legg, of East.	" G. Favell, of Trunks.
" D. M. Chawner, of Rainham.	" M. Easton, of Trunks.
" L. G. Finch, of Grangewood.	" R. Flack, of Trunks.
" A. Manning, of Hop.	" H. Henry, of Trunks.
" M. M. Morrisey, of Hop.	" M. Ockenden, of Trunks.
" E. M. Plumridge, of Hop.	" S. M. A. King, of Ealing.
" C. M. Sharman, of Wimbledon.	" M. M. M. Jones, of Holborn.
" G. Offord, of Tandem.	" W. E. Brasnett, of Holborn.
" P. M. Dace, of Eltham.	" J. M. Skinner, of London Wall.
" A. M. Toynbee, of Clissold.	" R. K. Gerrish, of London Wall.
" M. E. Walker, of Walthamstow.	" H. A. Cornwall, of Mayfair.
" G. Hus, of Clerkenwall.	" M. M. Keenan, of Archway.
" C. L. Snowling, of Regent.	" M. Gordon, of Western.
" V. L. Hems, of Toll "A."	" O. Clark, of City.
" L. J. Brown, of Toll "A."	" R. K. Rumsey, of Hayes.
" F. Bentley, of Toll "A."	
" V. T. Hampson, of Toll "A."	
" B. M. Amer, of Toll "A."	

RETIRED C.T.O. OFFICERS' OBITUARIES.

IN this present issue of the *T. & T. Journal*, as in that of August, it is with deep regret that one has to record yet another three to the list of those who have passed over.

Mr. A. J. Jellie, late Superintendent, T.S., who had settled in Torquay was on a visit to his son at Wickford (Essex) when he was seized with an internal malady and was hurried to Rochford hospital, where he died, on July 25. The funeral took place at Southend-on-Sea. Messrs. S. Pearce (late Supt.) and R. Moody (T.N.S.) attended. Mr. Jellie entered the service in 1883 and retired as Superintendent in 1928.

On Sunday, Aug. 2, Mr. F. W. Miles, after less than three days' illness, also departed this life at Bromley, Kent. Messrs. R. T. Jacobs, C. S. Keen and C. W. Parkes were present at the funeral service in the Parish Church. His had been an active life, "in all good works." For many years he resided at Clapham and was long connected with one of the political associations. He was Manager of Clapham Schools for over 30 years, a Governor of Furzedown Training College, and was one of the Management Committee of the Clapham School of Art. He was also a staunch adherent of the church of St. Martin-in-the-Fields, and on removing to Bromley soon became actively connected with that of the latter parish. Mr. Miles entered the service in 1877, subsequently specially attached to T.N.S. and S.G., promoted Overseer 1901, A/S II 1911 and finally to Chief Supt, 1922, in which same year he reached age-limit and retired.

Miss Louie Curtis passed away quite suddenly on Aug. 13, at Herne Bay, Kent. This much-respected lady, and in her younger days an exceptionally smart Wheatstone operator, entered the C.T.O. in 1870, served under the late Miss ("Dolly") Winter and became A/Supervisor, 1903, Supervisor 1908 and retired 1913, leaving behind her the record of a very faithful servant to the Department, while most happily disposed to all those around her.

J. J. T.

TELEPHONE FORMULAE.

T.T.³ IS THE JUICE OF EXISTENCE TO THE T.S.

Easy.

$$\frac{\text{C.M.}}{\text{C.O.}} + \frac{17}{\text{T}} + \frac{\text{T}}{\text{C.M.}^{52}} - \frac{\text{T}}{197} \text{ W.} = \text{A.N.} + 1.$$

$$\frac{\text{D.M.}}{\text{C.O.}} + \frac{17}{\text{S.E.}} + \frac{\text{T}}{\text{T}} \times 8 = \text{R.A.X.}$$

C.O. II

N. G. H.



The Dreary Optimist.

As the train sped out of the terminus the rain was falling in sheets, buckets, and stair-roads. One didn't know quite whether to blame St. Swithin or the B.B.C. announcer, or merely to accept the rain as a sample of summer. The only amusement I could get out of the sodden affair was to remember the opening sentence of the small boy's essay, in which he said "It was raining cats and dogs and the road was soon full of poodles." I suppose I must have chuckled, because the man sitting opposite to me leant forward and said "Beautiful weather." "Perfectly charming," I replied, with a ghastly attempt to be jovial. "Yes," said he, "it is: so good for macintoshes." "But why eat toffee more on a day like this than on any other day?" I asked. "No, no," said he, "not toffee, waterproofs—you see I make 'em, and I make gamps and gum boots and sou'westers and goloshes." "Aha," I said, "vested interests—what!" "Well, partly," he replied, "but my satisfaction with the weather is not wholly selfish. Oh, no—really, of course, if you examine the position fairly, this sort of weather is the best for all parties." "Pish," said I, "and also Bah, Poof, and Bosh!" "No, no," he replied, hastily, "not at all and none of these. Consider for a moment how excellently my beans and peas are faring—and yours also, I hope (there I bowed and raised my hat). The grass, too, is in splendid condition, and is providing abundant fodder for the cows. In consequence we are getting and shall continue to get, rich milk and cream and plenty of butter and cheese. Think, also, of the thousands of householders who have paid a garden-hose fee to the water companies—no need to use their hoses, reduced water consumption, less expense to the companies, and the hose fee all profit. Turning, then, to the local authorities, what do we find? Economy in administration—no need to water the roads: saving in water, smaller depreciation in water-carts, saving in wages of water-cart drivers, reduction in rates leading to popularity of town council. Result, returned unopposed at the next election as the 'Progressive Party with the Real Interests of Ratepayers at Heart.'" "Then," he continued, warming to his subject as the rain streamed down outside the carriage windows, "the wasps this year have been drowned and the plums won't be eaten: plenty of jam for the children: no need for butter: saving in domestic expenses: reduce the housekeeping allowance: buy the wife a new hat. Result—contented wife, generous husband, marital bliss." "But," I interjected, "what about the effects on health of the lack of sunshine?" "Excellent—more illness, prosperity for doctors, chemists and undertakers: more rheumatism, more patients at the spas: bath-chair trade revived and set on its wheels again: increase in bath-chair attendants: relief of unemployment: fewer people drawing unemployment benefit: Chancellor balances Budget: 'Saviour of Country' Houses, too—you know how it is: there's a tile or two missing in the roof and you don't worry. But when the rain commences to come in you jump to it and send for the builder. Result: tilers and tile-makers kept busy: house kept in better repair: easier to sell at more than you paid for it: more profit: buy a car: save railway fares: get rich quicker: retire earlier: live longer." "What about floods?" I gasped, "they ——" "Enrich the ground by depositing fresh soil, drown caterpillars and wire-worms: more crops and better crops: cheaper foodstuffs: reduced domestic expenses: buy wife a new dress. Result—rapture, and you can get your trouser-buttons sewn on without repeated request. Floods, too, bring more water to the sea and more food to the fish. Result—ample supply of fish, can afford to have more than one Friday each week. Friday being pay day the more there are the better for the wage-earners. Result, wave of industrial prosperity. Let us not forget the children, too—the more water there is in the sea the more can be taken out in buckets. There will thus be an increased demand for buckets, leading to a revival of the tin-plate trade. Then there's boots—must have waterproof soles—boost in boot-trade —."

But at this moment the train came to a stop and the dreary optimist alighted, leaving me at peace. If and when you read this, I hope the sun will be shining, and I hope, too, that you won't have to listen to the chattering of a cheery pessimist.

PERCY FLAGE.

Songs from the Telephone Play.

In response to application for copies of the words of certain numbers from the last Telephone Play, we reprint the following:—

(1) *The Messenger's Song.*

(Sung by Mr. John Angus as "Terry.")

I'm from Cornwall House,
Dingy Cornwall House,
Where in uniform I'm clad.
I go round with messages all day long,
Yet they turn on me when things go wrong.

Sometimes a paper's missing from the file,
Why do they all blame me?
Sometimes the ink's forgotten for a while,
Why do they all blame me?
When the Chief's about so they can't get out,
Or if they find the bar's no longer free,
Or if somebody below them gets promoted first,
Why do they all blame me?

Once I dropped a tray,
Just a luncheon tray,
With a crash it reached the floor.
Though my nerves were shattered by the fall,
No one sympathised with me at all.

Simply because a luncheon met its end,
Why do they all blame me?
Simply because the china wouldn't bend,
Why do they all blame me?
They daily plot that they'll make things hot,
And their state of mind is plain to see.
Do they ever give a fellow half a sporting chance?
Not likely! They all blame me.

Sometimes old Snowden gives them all a shock,
Why do they all blame me?
Sometimes the Chief arrives at 9 o'clock,
Why do they all blame me?
When the leave's all gone that they counted on,
Or if the Bank returns their cheque R/D.,
They look for a victim just as Adam did,
And Blimey! They all blame me.

(2) *The Festal Pound.*

[No allowance granted for the Entertainment of Visitors at the opening of an Exchange. With any necessary apologies to our brothers of the general Press!]

Here in my hand I have a pound,
It is to pay for refreshments all round.
What can I offer that guests will not shun,
What can I buy with a pound—only one.

Where are the Press? Gone in their cars.
They will not stay without wine and cigars.
There is no whisky, their deep thirst to slake,
No cash for cocktails—just weak tea and cake!

(3) *The Vanishing Bonus.*

Bonus, I prized you most dearly,
Meeting you, I was glad.
Though you were not excessive,
All that you were I had.
Now we are torn asunder,
Famine and want are nigh.
How can I live, I wonder,
Now you have said "Good-bye."
How can I live without you:
How can I let you go?
I, that you helped exist,
You, I relied on so:
You, I relied on so.

Bonus, I'll tell Philip Snowden,
Now with his Budget cloyed,
I, when I save five shillings,
Add to the unemployed.
Then in remorse and sorrow,
He'll give you back to me,
You that I need for clothing,
Food, coffee, milk and tea.
How can I live without you:
How can I let you go?
I, that you helped exist,
You, I relied on so.
I, that you helped exist, dear,
You, I relied on so.

[All weep.]

Numbers 2 and 3 were sung with suitable melancholy and soulful solemnity by Mr. Cracknell as "Mr. Woof," the District Superintendent.

More Axioms.

Things which are equal to the same thing are equal to one another. Therefore Headquarters and its subordinate offices are equal, for both are equal to anything.

Why is it necessary to be dishonest in "taking a straight line"?

Because a straight line is that which lies, evenly, between its extreme points.

Contributions to this column should be addressed: The Editress, "Talks of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLASGOW TELEPHONE NOTES.

Spreading Influence of the Detective Novel.—One of the Assistant Traffic Superintendents in training in this district was handling a case in which an "A" phonogram had been debited to a spare line on the — Exchange. The text of the message read "Twins, a boy and a girl; Love," and, having very little other evidence to work on, the A.T.S. had such a shatteringly original idea for using the text to solve the problem that he just grabbed his hat and bolted from the office. His objective was the office of the *Glasgow Herald*, and, arriving there, he asked for back copies of the paper for the period round about the date of the phonogram. Rapidly, he searched these papers for announcements of the birth of twins in the — area, and when an entry for the correct date was found for a family named R—, it was only by recalling the many accounts of the self-restraint of genuine detectives that the amateur C.I.D. man prevented himself from breaking into ribald song. Having accomplished what is recorded as the quickest return to the office up to the time of going to press, he feverishly consulted the Telephone Directory and found the same name R—, with a — number—which his now heated imagination was easily coaxed into considering similar to that on the "A" message. Nothing could go wrong now, and he rang up this number with all confidence. He was rather sobered by the subscriber saying that he had not passed a telegram anywhere near the date mentioned, but, feeling so sure that he must be right, the A.T.S. asked the subscriber to excuse him if his next question was of rather a personal nature, but it was really relevant to the case. Had not his family been increased by twins on the date in question? The reply was terse, but disconcerting: "I, Sir, am a bachelor!" Collapse of the budding Holmes. (H. W. Smart.)

Weddings.—Miss L. L. Wells, Central Exchange; Miss A. G. Baird, Cambuslang Exchange.

On Appreciation.

Nearly always a word of encouragement or praise on suitable occasions is appreciated. (P.O. Pamphlet.)

If with pleasure you are viewing

The kind of work a man is doing;

If you like him, if you love him, tell him now.

Don't withhold your approbation

Till the parson makes oration

And he lies with lilies o'er his brow;

For no matter how you shout it,

He will never know about it,

He will never know the tear drops you have shed.

If you think some praise is due him,

Now's the time to slip it to him.

For he cannot read his tombstone when he's dead. (Anon.)

He was a man of outstanding personality, always approachable; always jovial, he knew the value of a few words of appreciation and wisely used these instead of paying big salaries.—(Westrupp.)

Praise judiciously given may act on one man like an application of our bone-meal to a fruit tree, and bring out all the pippins that are in the wood; while in the other it may simply result in his going all to top. Praise goes a long way with a good man, and some employers stop there; but cash goes the whole distance, and if you want to keep your growing men with you, you mustn't expect them to do all the growing. It has always been my policy to give a little extra courtesy and consideration to the men who hold the places that don't hold the extra good salaries. It's just as important to the house that they should feel happy and satisfied as the big fellows. And no man who's doing his work well is too small for a friendly word, and no fellow is too big for a jolt that will knock the nonsense out of him. You can't afford to give your men a real grievance, no matter how small it is; for a man who's got nothing to occupy him but his work can accomplish twice as much as one who's busy with his work and a grievance. The average man will leave terrapin and champagne in a minute to chew over the luxury of feeling abused. Noise isn't authority, and there's no sense in ripping and roaring and cussing around the office when things don't please you. For when a fellow's given to that, his men secretly won't care a cuss whether he's pleased or not. They'll jump when he speaks, because they value their heads, not his good opinion. Indiscriminate blame is as bad as indiscriminating praise—it only makes a man tired. Consider carefully before you say a hard word to a man, but never let a chance to say a good one go by. Praise judiciously bestowed is money invested. It's not hard for a clerk to find good points in a boss who finds good ones in him. And a diet of courtesy and consideration gives girth to a boss.—(Old Gorgon Graham.)

I believe you to be a better man than you think yourself to be.—(O. Henry.)

A UNIQUE KIOSK.

CRITICS of the Telephone Service (I regret to say that such people do exist) have at times expressed unfavourable opinions on the design of telephone kiosks, and on one occasion a newspaper contributor suggested that we should have the structures designed by an artist. Whether this was intended as a "nasty one" for Sir Giles Gilbert Scott or as an oblique reference to the Royal Academy selection board, or was just pure ignorance, must for ever remain a matter for conjecture. One is, however, inclined to wonder if the aesthetic tastes of this knowing critic would be satisfied with the public telephone (illustrated) now erected in the Broadway, Newbury.

It must be admitted that neither the erection of this 'kiosk' nor the design of the superstructure was entirely due to the Post Office. Actually the clock tower is a gift to the town of Newbury, and its erection would normally have involved the removal of an existing kiosk which was of the type considered offensive to the artistic temperament.



However, we do things a little better than that in the Reading District, and a little skilful negotiation resulted in the call office being built into the tower, thus producing something unique in kiosks.

It is perhaps fitting that Newbury should possess so quaint a telephone call office, for, according to Mr. Kelly (of directory fame) the town is of very ancient origin. "Antonius," says Mr. Kelly, "makes mention in his 'Itinerary' of the station of Spinae; and Newbury, as its name implies, arose and had its beginning out of the ruins of Spinae."

This statement, I confess, means little to me, but my informant is a little (but not much) clearer when he says that in Saxon times the town, consisting then of only 51 houses (they kept accurate count in those days), belonged to a Thane named Ulward.

The directory gives pages of this kind of thing, together with historical facts about the famous "Jack of Newbury," and it seems that it would not be out of place if future issues contained a reference to what someone justifiably (though not in the opinion of an English purist) described as the most unique kiosk in the country.

F. J. L.

LONDON ENGINEERING DISTRICT NOTES.

On July 29, Downland Exchange, installed by the Automatic Telephone Manufacturing Co., Ltd., was opened to serve the Merstham-Coulsdon area. The exchange has an initial multiple capacity of 1,100, ultimate 5,000, and 477 subscribers' lines from the hypothetical exchange on Merstham, Purley and Burgh Heath were successfully transferred.

L.E.D. Inter-Communication P.A.X.

In a complicated telephone network such as that in London it is essential that communication between the various automatic and manual exchanges be effected by other means than the public system for ensuring quick and efficient co-operation in the advising and clearing of faults, especially in the case of major breakdowns.

Since the inauguration of automatic working in London each automatic and C.C.I. exchange has had a private wire to the Tandem exchange terminating on a magneto switchboard, and has thus been able to establish connexion with any other exchange in the network. It was considered, however, that the magneto system was not entirely satisfactory as regards reliability and speed of connexion, so steps were taken to introduce automatic working in the form of a P.A.X. separate from the public system.

This P.A.X. has been installed by the A.T.M. Co. in the Holborn Exchange, and comprises the following main items of equipment:—

140 Preselctors with capacity for 200.

25 First selectors with capacity for 30.

and 34 Final selectors with capacity for 60.

Each automatic and C.C.I. Exchange has two stations on the one line to the P.A.X., an indicator and dial on the test desk and a telephone in the apparatus room.

Party line working is provided by allotting two final selector numbers per exchange on the P.A.X., the X and Y ringing feature being catered for by special jumpering. At present 111 exchanges are connected to the P.A.X.

Thorough tests were carried out at each exchange in co-operation with the P.A.X. before the transfer, the receipt of incoming calls, correct dialling out and transmission being verified in every case.

The transfer was effected by the change over of heat coils on the Holborn frame at 8.15 a.m. on Wednesday, Aug. 19. From 8.15 a.m. to 9.0 a.m. the magneto telephones in the apparatus rooms were changed for automatic type and during the day test calls were passed to neighbouring exchanges to verify the correct conditions.

The introduction of the P.A.X. should help considerably in improving the efficiency of the London Automatic System as a whole, and the use to which it is put in effecting close and speedy co-operation between all exchanges should amply justify the capital cost and maintenance charges.

London Engineering District Amateur Sports Association.

Cycling.—In the Civil Service 50-mile Road Championship the L.E.D. Team did exceedingly well, B. Bevan (I.C.T.) and A. H. Glass (I.C.Y.) finishing first and fourth respectively.

S. A. Eadon has been invited to represent England in the World's Road Championship, to be held in Denmark.

Future Events.—The Swimming Section will hold a gala at Lambeth Baths on Oct. 5. Among other interesting events the team race for the Denman Cup, which carries with it the Section Championship of the L.E.D., and the L.E.D. 100-yards Championship for the McIlroy Cup will be decided. The present holders are the South-East Internal Section and H. F. Crow (I.N.E.) respectively.

Social.—A series of dances will be held throughout the season. The first will be on Nov. 6, at Princes Hall (Lambeth Baths). Ernest Rutherford and his Band, from the Palladium have been engaged.

CORRESPONDENCE.

"MENTAL WIRELESS."

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—The idea submitted by your contributor who writes on the subject of "Mental Wireless" is not new. The ancients are reputed to have used this method of communication, and probably did so. In any case, actual and genuine demonstrations have been given in more modern times. But, as you remark, general reading of each other's thoughts, and optical materialisation of mental pictures would revolutionise the world—probably for the worst.

If, however, such a system was possible, and adopted, it does not require a high degree of intelligence to visualise the demise of the whole P.O. Department. No telegraphs, telephones, or posts would be necessary. But what a jam!

It would appear, however, that the "operator" would be liable to a much greater risk of nervous breakdown than any who ever manipulated a mechanical circuit. And when we consider a few details, the truth of this will be realised.

Nervous energy is one of the many forms of vibratile energy. This is due to vibrations in the so-called ether which are similar to those employed in wireless. But the ether waves in telepathy must be very different to those we use for the latter purpose. Thought transference is easily possible between England and America, whereas powerful machinery is required to develop ether waves capable of crossing the Atlantic. In the higher order of animal life, the nerves are insulated much the same as with conductors of electricity. But for insulated, we must substitute the word "medulated." The nervous energy required by higher functions of the body, then, must be liable to loss by radiation or conduction as with electrical currents. The logical conclusion is that the highest forms of this energy must, to a still greater extent, be subject to diffusion by an extremely delicate and subtle character of nervous vibrations. It is asserted that they are also subject to radiation outwards from the point where they originate, just as electrical radiations in wireless. Most types of vibratile energy can call up answering vibrations (says T. Stacey Wilson, in "Thought Transference," and to whom I am indebted for these details) in structures capable of originating vibrations of the same type: called "transference of energy" from one body to another. The essential condition which must be satisfied before this can take place is that two vibratile structures must be in tune; again, the same as in wireless sympathy. Mr. Wilson tells us that the human brain sends out ether vibrations which we call radiating energy. May not these, he queries, when controlled, and modified by the higher element of our personality, constitute a physical vehicle for that type of intercommunication which we speak of as "thought"?

It is suggested that the homing instinct of a pigeon is due not to the home cote, but to the company of its companions. Experiments are now being conducted in which a bird is taken about 15 miles away from its home, at the same time transferring its companions to some other spot. If, under these conditions, the pigeon, on its return, refuses to remain in its normal home, but flies away to the new abode, it would be extremely strong proof of thought transference.

But, generally speaking, birds are very poor subjects. There is not the certainty that their brain development is of a sufficiently high order to ensure success.

We are informed that a nerve cell which is originating a special type of vibration is sensitive to vibrations of a similar type; in other words, that we are all potential wireless circuits!—Yours faithfully,

W. T. L.

(T.S.) C.T.O.

FOR OUR ADVERTISERS.

ALL enquiries should be addressed to the Department of Overseas Trade, 35, Old Queen Street, London, S.W., except where otherwise stated, quoting reference number in all cases. Supplies, &c., required by:—

Australia.—Melbourne, Postmaster-General's Department, Sept. 15. Supply various quantities instrument cords accordance specification No. 22A (A.X. 11023). Also Sept. 15. Supply telephone switchboard cords (A.X. 11028). *New Zealand.*—Wellington, Post and Telegraph Department, Sept. 7. Telephone cords (A.X. 11043). Also Sept. 8. 1,000 three-way telephone plugs (A.X. 11006) and 100 four-conductor cords (A.X. 11046). Also Sept. 15. Automatic dial mountings and resistance spools (A.X. 11042). Also Sept. 22. Sixty-three miles V.I.R. wire (A.X. 11039). S. African Railways and Harbours, Sept. 28. Twelve months' supply and delivery electric lamps, twelve months ended December, 1932. Specification loaned by D.O.T. as above. New Zealand Railways, Nov. 19. Inter-call telephone system between Christchurch and Invercargill (A. 11060).

The Board of Trade Journal reports South African duty on radio apparatus and accessories, not including batteries, is to be raised 3 to 20% *ad valorem*, except when imported for merchant ships or by licensed broadcasting concerns.

The Commercial Counsellor to the British Embassy in Moscow has prepared a report on the organisation of foreign trade of Soviet Russia, a copy of which may be obtained from H.M. Stationery Office, price 9d. Among many other items dealt with it indicates the principal bodies concerned with the importation of electrical equipment. Telegraph and telephone apparatus is specially mentioned.

Report on economic trade conditions in Latvia by H.M.'s Consul at Riga, now issued by D.O.T. Quote No. C. 3590. Also "Hints for Commercial Visitors to Latvia." Quote No. C. 3615. A new number of "Hints for Commercial Visitors," to Belgium is also now available. Quote No. C. 3615.

A confidential memorandum on the appointment of agents and the best methods to be adopted in trading with Portugal and Portuguese West Africa is also available to firms whose names are entered on the Special Register of the D.O.T. British firms should make further enquiries, quoting No. C.X. 3591, at address as above.

J. J. T.

C.T.O. NOTES.

Retirements.—Messrs. T. G. Donno, Principal Clerk; G. W. Willcox, Assistant Superintendent; F. Bradshaw, W. C. Griggs, E. J. Tarrant, Telegraphists; E. Davy, Assistant Inspector.

Obituary.—We regret to record the death of Miss Jessie Cameron. Entering the Service in 1884 she attained the rank of Supervisor in 1919, and retired in October, 1928. She was greatly beloved by the staff and her supervising colleagues and we extend to her relatives our deep sympathy.

Mr. J. J. Moul, late Assistant Superintendent, we regret to learn, died in June last. He retired in 1913 and we beg to offer our sympathy to his wife and daughters.

The death, which we much regret to announce, of Miss M. A. Cooper, removes from our midst one of the very oldest links extant of the old Electric and International Telegraph Company into which she entered in 1864. She transferred to the Post Office in 1870 and became the first Lady Superintendent of the C.T.O. in 1903, retiring in 1906.

Another death which it is our pain to record was that of Mr. W. J. Graham. We desire to extend to his family our sincere condolence.

Retirement of Mr. T. G. Donno.—Mr. T. G. Donno, Principal Clerk of the Central Telegraph Office, who retired from the Service on July 4, 1931, entered the Post Office Service in the Savings Bank Department on Dec. 6, 1886. He was appointed Telegraphist at the Central Telegraph Office on Dec. 21, 1889, after taking first place at the Open Competitive Examination. After passing a limited competitive examination, he was appointed Third-Class Clerk on Sept. 6, 1895, promoted to the Second Class of Clerks on Nov. 5, 1902, to the First Class of Clerks on Jan. 9, 1909, to a Superintendentship on June 4, 1912, and to the Principal Clerkship on June 11, 1914.

Serving in a clerical capacity under all the Controllers of the Central Telegraph Office, beginning with Mr. (afterwards Sir Henry) C. Fischer, Mr. Donno has occupied the positions of Chairman and Trustee of the Sir Andrew Ogilvie Memorial Fund, Chairman and Trustee of the C.T.O. Messenger's Institute, and School Manager of the Post Office Messengers' Classes under the London County Council. An ardent bowler and an active bowling official, he was the founder the C.T.O. Bowling Club in 1922, and has been Hon. Secretary of the club from then until his retirement. In addition to his bowls activities, Mr. Donno has been a consistent supporter of the C.T.O. Billiards Competitions, winning the 1930-31 Handicap, and in his early days, as a member of the "E" Division Cricket team, took part in many inter-divisional games.

Sport.

The Cable Room Sports.—In glorious sunshine, the Fortels held their annual Sports and Garden Party at the Civil Service Sports Ground, on Friday, July 24.

A crowd of about 400 witnessed the efforts of the competitors, and in between the events, either listened to a fine programme of "pick-up" music, or "tried their luck" at the various side-shows.



FINAL 100 YARDS HANDICAP.

It was very pleasing to see so many well-known faces of past members of the club—some now enjoying well-earned rest, and others now in different spheres.

Although a veterans' race was on the programme, it seemed that a large number of the entrants in other events were competitors in our sports meetings of a decade ago! Come on, young 'uns, let's hear from you!!

The relay race gave us a particular thrill, especially from the last take-over, when one of the I. & I.C.C. boys, running on the outside, ran and won a magnificent race.

Some good fun was seen in the bob-apple race. Bubbles and gurgles being much enjoyed—by the spectators!

The races over, prizes were presented to the successful ones by Mrs. Stuart-Jones, supported by the Controller and the Deputy Controller.

Our footsteps then took us to the Pavilion, where we listened appreciatively to Messrs. Merlin Vaughan, P. Phillips and W. Norley, who sang to us in fine manner. After that we danced, despite the hot weather, to the music of Archie Hancock and his Centenna Dance Band until it was time for us all, very reluctantly, to depart homewards.



1 MILE WALK.

Altogether, a wonderful day out—by some voted the best yet—but, in any case, apart from the kindness of the Clerk of the Weather, almost entirely due to the energetic and unceasing efforts of Secretary George Parkin. Thanks also to Handicapper Eddie Davis, for providing us with some close finishes.

Results.—100 yds. Men's Handicap—Newland 1, Woolmore 2, Watts 3; 100 yds. Veterans' Handicap—Randall 1, Parkin 2; 80 yds. Boys (6-14 yrs.)—F. Moore 1, L. Burrows 2, L. Pepper 3; 80 yds. Girls (6-14)—Joyce Bath 1, Sheila Moore 2, Joan Davis 3; Ladies' Egg-and-Spoon—Miss Alders 1, Miss Clavey 2, Miss Chappel 3; 1 Mile Men's Handicap—Tyrrell 1, Moren 2, Matthews 3; Boy Toddlers (under 6)—Master Cook 1, Master Guest 2; Girl Toddlers (under 6)—Miss Randall 1, Miss Brimmer 2; Mixed Matrimonial Race—Mr. Day and Mrs. Herrick 1, Mr. Carver and Mrs. Watling 2; 440 yds. Men's Handicap—Carver 1, Cole 2, Jones 3; Family Team Race—Family Pepper 1, Family Moore 2, Family Davis 3; Men's Bob-Apple—Woolmore 1, Harnden 2, Carver 3; Ladies' 440 yds. Relay—Central Hall "A" 1, Foreign Phones 2; 440 Men's Open Relay—I. & I.C.C. 1, "H" Division 2; 1 Mile Walk—Jones 1, Megenis 2, Chapman 3.

SHEFFIELD NOTES.

Appointment of Mr. E. W. Cross, Assistant Traffic Supt., to Assistant Surveyor.—On Saturday, Aug. 1, Mr. E. W. Cross left Sheffield to take up his appointment as Assistant Surveyor, Class II., Scotland Eastern District. Having graduated from the Engineering Department, Mr. Cross spent 5 years in the Traffic Section, the last six months as Exchange Superintendent, Sheffield.

As a mark of appreciation from the staff he was presented with a silver cigarette case and a Rolls razor. The best wishes of all his friends go with him in his new sphere of work.

Retirement of Mr. W. H. Cross.—On Friday, Aug. 14, at a smoking concert, Mr. W. H. Cross, Higher Clerical Officer, Engineering Department, said official farewell to his many friends in Sheffield. Mr. Cross, who retired on July 31, has seen 44 years service, 18 of which have been spent in Sheffield. During the course of a most enjoyable musical evening, the Chairman, Mr. Lomas, Sectional Engineer, presented Mr. and Mrs. Cross with two leather easy chairs and a case of silver spoons as a mark of the high esteem in which Mr. Cross was held by all who knew him. Several speakers, including Mr. T. E. Herbert, Superintending Engineer, Manchester, paid eloquent tribute to Mr. Cross as a man and a friend. He retires with the very best wishes of everybody for a long and happy retirement.

Resignations for Marriage.—Misses M. L. Patterson, J. Hitch, N. Hague, F. Sykes, J. Woolley, A. M. Thompson: all of Sheffield Exchange. Our best wishes go with them for the future.

LEEDS DISTRICT NOTES.

WE have to record with regret that our District Manager, Mr. J. F. Murray, met with an accident whilst on his holiday at Teignmouth. He was unfortunate enough to fall on some rocks and break his collar-bone. He is progressing as satisfactorily as can be expected, but his mishap has caused him to be absent from duty for considerably longer than he intended. We hope he will return quite "mended" and that there will be no ill effects afterwards.

The Historical Pageant of Bradford.—In conjunction with the Wool Fair, held in Bradford in July, it was decided to hold a pageant in Peel Park from the 13th to 18th inclusive, the object being to advertise the City and to depict the outstanding events in the history of "Woollenopolis."

The idea was first mooted at the beginning of the year, and the process of collecting the 7,500 odd performers had been going on for nearly six months. It was essential that the arrangements for marshalling such a large number of performers for their respective episodes should run smoothly, and the success of the pageant depended on the ease with which the Master could get in touch with the marshalls situated at various points around the arena. It was decided that the best means of communication would be by telephone, and at the Pageant Committee's request, the department undertook to loan, install, and maintain the necessary apparatus free of charge. The main switch consisted of a 10-way "multiphone" board fitted near the Royal Box, from which six extensions were run to the various marshalling points. The extensions consisted of magneto telephones and were housed in night watchmen's huts.

The installation of the equipment was done by members of the engineering staff outside official hours. Fortunately, it was unnecessary to erect poles, as the overhead cables were anchored to trees and were inconspicuous.

The telephones were manned by volunteers from the Bradford Exchange day and night staff, who took turns to staff the telephone and watch the pageant.

The duties of the telephonists were varied and, apart from the telephone attendance, the next most important job seemed to be that of cloak room attendant for the performers.

The interest in the pageant was so great that the run was extended for a further three days, and, as a result, it is hoped to hand over about £2,000 to the local hospitals.

It is certain that the success of the pageant was in no small measure assisted by the services of those members of the Engineering and Telephone Staff who so willingly gave of their spare time to fit and operate the controlling points.

The following extract is from a local Bradford paper:—

"Phone Controls. An Indispensable Feature.—If, during Pageant Week, telephone subscribers are not given the 'Hello' call from the switch-board attendant at the telephone exchange as quickly as they think should be the case they must not grumble, but rather say to themselves with a little feeling of pride, 'I'm doing my bit to help the pageant to be a success.'

"In order to facilitate the work of managing the crowds which are expected to attend each performance in the huge arena in which the pageant will be held it has been found necessary to have telephones installed, and over eight miles of cable have been laid in the park. Seven telephone control boxes have been erected at the various performers' entrances, and loudspeaker telephones have been placed at various points to facilitate the smooth working of the pageant."

"Voluntary Installation.—All the control boxes are in direct communication with a master control box, where the pageant producer will be keeping a watchful eye over everything. He should certainly have no difficulty with any of the control points, for these will be manned by trained girl operators from the various Bradford exchanges. The entire installation work has been done by Bradford telephone engineers, who volunteered for the job.

"Mr. Frank Lascelles, the Pageant Master, considers that the telephones are nearly as indispensable as the performers. 'It would be impossible to run such a pageant without phones,' he said. 'One of the essential points in making a pageant a success is to get performers to enter into view at exactly the right moment, otherwise the dramatic value is lost. Even a few seconds error can mar a scene, and the only way to ensure the entry of performers at the right time is by 'phoning for them.'"

Promotions and Transfers.—Hearty congratulations are tendered to Mr. G. Y. Fryer, Clerical Officer, Superintending Engineer's Office, Leeds, on his promotion to be Higher Clerical Officer at Norwich, in the Eastern Engineering District. Before leaving to take up his new duties on Aug. 10, Mr. Fryer was presented by the Superintending Engineer (Mr. J. W. Atkinson) with an electro-plated tea service as a token of the esteem in which he was held by the staff generally.

On July 11, Mr. M. P. Keen, Clerical Officer, Superintending Engineer's Office, Leeds, left to take up a similar position in the Ministry of Transport Department at Leeds. Mr. Keen had only been in the district for a comparatively short period, but the barometer and fountain pen presented to him by Mr. W. H. Thornburn (Higher Clerical Officer) on behalf of the staff, showed the regard his colleagues had for him.

Cricket.—Yorkshire Cup: Leeds v. Hull: Semi-Final.—It was disappointing that owing to the vagaries of the weather the game fixed to be played on Aug. 6 had to be abandoned.

The postponed game was played at Hull on Aug. 13. The weather looked none too propitious as, under grey skies, the Leeds team, with their supporters, set off from City Square. Leeds batted first and knocked up a total of 108, which, on a soft wicket, was regarded as fairly good. W. Hudson was the outstanding batsman, scoring 54 not out. The bowling of Spence, of Hull, was exceptionally good, his deceptive fighting of the ball securing him 8 wickets. A great surprise came when the Hull team were dismissed for 23 runs. Woodhead and Rapp bowled unchanged, Woodhead securing 5 for 5, and Rapp 4 for 18. The Leeds fielding was extraordinarily good and every member played at top form. The match ended with Gaunt taking a wonderful catch as the ball was going away from him.

After the match the Leeds team and friends were entertained to tea at the kind invitation of Mr. W. J. Cabeldu (Head Postmaster, Hull) and the Hull team.

With Yorkshire well on its way towards the County Cricket Championship it is not surprising that our sisters and lady cousins are full of enthusiasm for the premier English game. Quite a number of matches have been arranged, played, and projected. Amongst others the Keighley Ladies Cricket team, which is captained by Miss P. Dixon, a telephonist from the Cross Hill Exchange, has been prominent.



[Photograph by W. Speight, Keighley.]

MISS PEGGY DIXON.

The Keighley Ladies' Cricket Team was chosen to play a challenge match against Heys Brewery, of Bradford. The match was played on the Lawkholme cricket ground, the Keighley Ladies winning by seven wickets. This was a creditable performance against such an experienced team.

The first "Test" match against Bradford Ladies was played at Great Horton, where Keighley recorded another victory, winning by 3 wickets.

The return match was played on the Lawkholme cricket ground the following week, and once more the Keighley Ladies had a splendid victory when, after scoring 76 runs, they dismissed their opponents for 45.

On August Bank Holiday Monday, Keighley Ladies were beaten for the first time at Keighley by Thongsbridge Ladies, the district pioneers of Ladies' cricket, who won by 11 runs. The return match is to be played at Thongsbridge on Aug. 22.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(Continued from page 260.)

- 1920, June 30 British Imperial Wireless Telegraphy Committee reported recommending a scheme of communication to India, the Far East, Australia and East and South Africa, with stages not exceeding 2,000 miles in length.
- 1920, July ... First criminal (Crippen) captured by means of wireless telegraphy.
- Freedom of Edinburgh conferred on Dr. Graham Bell.
- 1920, July 23 Continuous wave wireless working came into operation in British Post Office.
- Wireless concert broadcast from Chelmsford.
- Captain Round transmitted speech wirelessly from Ireland to Cape Breton Island.
- 1920, Aug. 19 Wireless telephone conversation carried on between a subscriber's house in London and an aeroplane flying to Paris.
- 1920, Aug. 21 Lafayette radio station, with world-wide range, opened at Bordeaux.
- 1920, Sept. 1 ... In British Mercantile Marine regulations introduced relative to (a) wireless automatic call apparatus, (b) number of operators to be carried, and (c) number of wireless telegraph "watchers" allowed.
- Government of India formed an Indian Wireless Telegraph Board.
- British Department of Scientific and Industrial Research appointed four sub-committees to assist the Radio Research Board in connexion with (a) the propagation of wireless waves, (b) atmospherics, (c) directional wireless, and (d) thermionic valves.
- British Air Ministry established a system of wireless meteorological bulletins.
- German Government opened a wireless service from Nauen for disseminating astronomical information.
- Rates for press telegrams raised.
- 1920, Dec. ... Wireless Telegraphy Commission appointed (Chairman, Dr. Eccles) to design Imperial wireless stations.
- 1920, Dec. 31 20,800,000 telephones in service in the world.
- 1921, Jan. 18 ... Anglo-French wireless telegraph service commenced.
- 1921, Jan. 26 ... Paris-Liverpool telegraph line re-established.
- 1921, Jan. 27 ... London-Berlin wireless telegraph service opened.
- Foundation stone of Paris Radio Central (Sainte Assise) laid. Service commenced later in the year.
- 1921, Feb. 18 ... London-Cologne wireless telegraph established.
- 1921, Mar. 10 ... Select committee appointed to inquire into the organisation, administration and charges of the telephone service.
- 1921, Mar. 31 ... Post Office deficit during previous 12 months, £6,736,511.
- 1921, Apr. 1 ... Main recommendations of the Post Office Committee on telephone charges, supported by the select committee, brought into force.
- 1921, Apr. 21 ... Creed perforator and printer in operation on London-Berlin wireless telegraph service.
- 1921, May 17 ... London Stock Exchange direct wire to Paris Bourse opened.
- 1921, May 18 ... London-Amsterdam wireless telegraph established.
- 1921, May 21 ... London-Dresden telegraph opened.
- 1921, May 27 ... London-Prague telegraph opened.
- 1921, June ... International Wireless Conference held in Paris to consider allocation of wavelengths.
- Conference of representatives of United Kingdom, the Dominions and India agreed that the Government should take steps to erect the remaining Imperial wireless stations as soon as they were designed.
- Radio Research Board asked to investigate position of wireless telephony.
- 1921, July 8 ... London-Turin telegraph opened.
- 1921, July 27 ... Select committee on the telephone service reported the evidence taken and recommended the appointment of a committee in the next session.
- 1921, Aug. 18 ... First station of the British Imperial Wireless Chain opened at Leafield (Oxford) by the Postmaster-General.
- 1921, Aug. 30 ... First Annual Convention of the American Radio Relay League held at Chicago.
- Marconi Wireless Telegraph Company took over for 25 years the postal, telegraph and wireless services of Peru, with Sir William Slingo, late Engineer-in-Chief, British Post Office, as Chief of the Department.
- Compagnie Générale de Télégraphie Sans Fils took charge of the same services in Ecuador for 30 years.
- Baudot multiplex telegraph tried successfully for radio work in France.
- 1921, Sept. ... C. S. Franklin experimented in short-wave directional wireless telegraphy.
- London Toll Telephone Exchange opened.
- New York-Cuban telephone service opened.
- Western Electric Company produced a satisfactory cable "Loading" alloy ("permalloy") which was tested by the Western Union Telegraph Company in deep water at Bermuda.
- 1921, Oct. ... Moullin devised a voltmeter for measuring high frequency currents of low values.
- Duddell invented a thermo-ammeter.
- Campbell introduced a variable standard of mutual inductance.
- Lorentz and Rosa produced formulae for calculating the inductance of a coil.
- 1921, Nov. 5 ... President Harding formally opened first section of New York Radio Central Station (Long Island).
- 1921, Nov. 20 ... Wireless telegraph messages transmitted from Carnarvon read in Australia.
- 1921, Dec. 18 ... Trial of duplex wireless telephony between London and Amsterdam via the aeriels at Southwold and Zandvoort.
- Wireless short wave stations operated by amateurs in America heard in Great Britain and Holland.
- Telegraph money order system extended to South-West Africa, Gambia, British Honduras, Danzig, &c.
- Wireless Telegraphy Commission reported.
- 215,000 Anglo-Continental telephone calls during the year.
- 1922, Jan. 1 ... London commenced transmitting long distance radio telegrams to ships at sea.
- 1922, Feb. 13 ... London-Rome wireless telegraph service opened.
- Australian Government concluded necessary agreements for establishing wireless communication between Australia and Great Britain.
- 1922, Feb. 17 ... Select Committee on the telephone service appointed. Minutes of the previous committee were referred to the new body.
- 1922, Feb. 22 ... Transmission by wireless telephony commenced at Writtle, near Chelmsford.
- 1922, Mar. 20 ... Select Committee on telephones reported and recommended *inter alia*, that the telegraph and the telephone services should be separated from that of mails and that certain charges should be reduced.
- Wireless communication opened between London and Halifax, Nova Scotia.
- P. P. Eckersley carried out experiments in wireless telephony in connexion with aircraft.
- 1922, Mar. 31 ... Post Office deficit during previous 12 months, £1,260,752.
- 1922, April 12 ... London-Berne wireless telegraph opened.
- 1922, April 24 ... Anglo-Egyptian wireless telegraph service opened to the public.
- 1922, May 3 ... C. S. Franklin described experiments in connexion with directional wireless using waves of about 15 metres with thermionic valve transmitters.
- Elias (Holland) expressed the opinion, based on Maxwellian equations, that it is difficult, if not impossible, to define exactly the capacity and inductance of a wireless aerial.
- 1922, June ... C. S. Franklin developed a system of spaced frame aeriels with definite directional properties.
- Post Office Committee formed to inquire into the causes of instability in multiplex telegraph working.
- American telephone subscribers put into wireless communication with passengers on the "America" 400 miles from land.

(To be continued.)